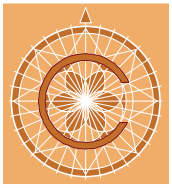

CHEMONICS INTERNATIONAL INC.

NIGERIA FOOD SECURITY ASSESSMENT

RAISE IQC, CONTRACT NO. PCE-I-819-99-00003-00

TASK ORDER NO. 819

Volume One: Summary Report

Submitted to:
USAID-Nigeria

Submitted by:
Chemonics International Inc.
1122 20th Street NW
Washington, D.C. 20036

August 2003

CHEMONICS INTERNATIONAL INC.

August 8, 2003

Ms. Anne Fleuret
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Reference: Nigeria Food Security Assessment Final Report: In fulfillment of Contract No. PCE-I-819-99-00003-00, prepared under the RAISE IQC, Task Order No: 819

Dear Ms. Fleuret:

Chemonics is pleased to present our Final Report for the Nigeria Food Security Assessment. In response to your comments and the length of the detailed reports on the three components, Economics/Agriculture, Nutrition, and HIV/AIDS, we are submitting the report in two volumes. *Volume One: Summary Report* consists of the executive summary, introduction, a short synthesis of the detailed reports on each of the three components, and priority options for improving food security in Nigeria. *Volume Two: Detailed Reports and Annexes* contains the detailed reports on the Economics/Agriculture, Nutrition and HIV/AIDS components, and Annexes, including Scope of Work, Work Plan, Assessment Team Itinerary, Contacts, and Bibliography.

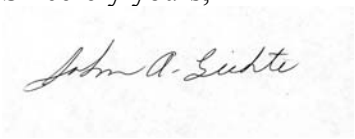
This report is submitted as two electronic PDF files, one for each Volume. As requested, we will send five hard copies of the report via courier, and will include a CD ROM version of the report for your use.

We regret that the Nutrition component does not contain the latest anthropometric data from the 2003 Nigeria Food Consumption and Nutrition Survey report, since that data did not become available to us before we went to press.

1133 20th Street NW Washington, DC 20036 Telephone 202-955-3300 Fax 202-955-3400

We greatly appreciate the help and guidance that you and the USAID staff provided to the team during its stay in Nigeria. The Assessment Team and Chemonics staff feel privileged to have had the opportunity to contribute to USAID/Nigeria's Food Security Assessment, particularly knowing that it will make a contribution to the preparation of your new country strategy. If there is any additional information you need or anything else we can do for you please contact us at your convenience.

Sincerely yours,



John A. Lichte
Project Supervisor for the
Nigeria Food Security Assessment

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The Nigeria Food Security Assessment team consisted of seven consultants, divided into three teams and the field administrator. The team included:

Kenneth Neils, Team Leader and Agricultural Economist
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Robert Love, HIV/AIDS Specialist
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George Oligbo, Field Administrator

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ACRONYMS

ABU	Ahmadu Bello University
ACGSF	Agricultural Credit Guaranty Scheme Fund
ADB	African Development Bank
ADP	Agricultural Development Program
AIDU	Agro-Industrial Development Unit
ANC	Anti-Natal Clinic
ARV	Anti-Retroviral
CAP	Capacity Acquisition Program
CAPA	Catchment Area Planning and Action (BASICS II)
CBARDP	Community Based Agriculture and Rural Development Project
CBN	Central Bank of Nigeria
CBNRMP	Community Based NRM Project
CBO	Community Based Organization
CCM	Central Control Mechanism
CDC	Center for Disease Control
CGIAR	Consultative Group on International Agricultural Research
CIDA	Canadian International Development Agency
CiSCGHAN	Civil Society Consultative Group on HIV/AIDS in Nigeria
CMD	Cassava Mosaic Disease
CMEWS	Crop Monitoring and Early Warning System
CMP	Cassava Multiplication Program
CSACEFA	Civil Society Action Coalition for Education for All
CSO	Civil Society Organizations
CWIQ	Core Welfare Indicators Questionnaire
DAIMINA	Developing Agri-input Markets in Nigeria
DfID	Department For International Development
DFRRI	Directorate of Food, Roads, and Rural Infrastructure
DHS	Demographic and Health Survey
DOTS	Directly Observed Treatment Short Course
EBF	Exclusive breastfeeding
ECOWAS	Economic Community Of West African States
EPP	Epidemic Projection Package
ERAP	Ekiti Rural Access Programme
ETF	Education Tax Fund
EU	European Union
FAMEG	Federal Agricultural Processing and Market Expansion Group
FAO	Food and Agriculture Organization of the United Nations
FAO/NSPSF	National Special Programme for Food Security
FAS	Foreign Agricultural Service

FBO	Faith Based Organization
FCA	Fadama Community Associations
FCT	Federal Capital Territory
FD	Fertilizer Department
FFE	Food for education
FGN	Federal Government of Nigeria
FHI	Family Health International
FIRRO	Federal Ministry of Infrastructure, Roads and Rural Organization
FMARD	Federal Ministry of Agriculture and Rural Development
FMOH	Federal Ministry of Health
FOS	Federal Office of Statistics
FPDD	Fertilizer Procurement and Distribution Division
FSFC	Federal Super-phosphate Company
FTF	Farmer-to-Farmer
FY	Fiscal year
GIS	Geographical information system
GON	Government of Nigeria
HEAP	HIV/AIDS Emergency Action Plan
HIV/AIDS	Human immunodeficiency virus/acquired immune deficiency syndrome
HKI-CDTI	Helen Keller Institute, Community-Directed Treatment for Ivermectin
IAR	Institute for Agricultural Research
ICRISAT	International Crops Research Institutes for Semi-Arid and the Tropics
ICS	Information and Communications Support for Agricultural Growth in Nigeria
IDA	Iron deficiency anemia
IDAS	International Donor Agencies
IDC	Industrial Development Centers
IDD	Iodine deficiency disorder
IEC	Information, Education and Communications
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Company
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IMCI	Integrated Management of Child Illness (WHO)
IP	Implementing partner
ITN	Insecticide Treated Nets
JEWEL	Jigawa Enhancement of Wetlands Livelihoods
KIT	Royal Tropical Institute
LACA	Local Action Committees on AIDS
LGA	Local Government Authority

MAP	Mandatory Attachment Program
MAP	Multi-Country AIDS Program for Africa
MARD	Federal Ministry of Agriculture and Rural Development
MCH	Maternal and child health
MICS	Multiple Indicator Cluster Survey (UNICEF, 1999)
MTCT	Mother to Child Transmission
NACA	National Action Committee on AIDS
NACB	Nigerian Agricultural and Cooperative Bank
NACRDB	National Agricultural Credit and Rural Development Bank
NAERLS	National Agricultural Extension and Research Liaison Services
NAFAN	National Farmers Association of Nigeria
NAFCON	National Fertilizer Company of Nigeria
NAIC	National Agricultural Insurance Corporation
NAPCA	National Agency for the Prevention and Control of AIDS
NAPEP	National Poverty Eradication Program
NASCP	National AIDS and STD Control Programme
NBI	Nigerian Bank for Industries
NCAM	National Centre for Agricultural Mechanization
NCFN	National Committee for Food and Nutrition
NCHS	National Center For Health Statistics
NCRI	National Cereals Research Institutes
NDE	National Directorate of Employment
NDHS	Nigeria Demographic and Health Survey
NFC	National Fertilizer Corporation
NFCC	National Fertilizer Coordination Committee
NFDO	National Fadama Development Office
NFDP	National Fadama Development Program
NFTC	National Fertilizer Technical Committee
NGO	Non-governmental organization
NISER	Nigerian Institute of Social and Economic Research
NMS	National Micronutrient Survey
NNPLWHA	National Network of Persons Living with HIV/AIDS
NPC	National Planning Commission
NPEP	National Poverty Eradication Program
NPHCDA	National Primary Health Care Development Agency
NPK	Nitrogen-Phosphorus-Potassium
NRCRI	National Root Crops Research Institute
NSPFS	National Special Programme for Food Security (FAO)
NSS	National Seed Service
NTBLCP	National Tuberculosis and Leprosy Control Programme
OVC	orphans and vulnerable children
OXFAM	Oxford Committee for Famine Relief

PABA	People Affected by AIDS
PCA	President's Council on AIDS
PCU	Project Coordinating Unit
PICS	Participatory Information Collection Survey (UNICEF, 1994)
PLWHA	Persons Living with HIV/AIDS
PRA	Participatory Rural Appraisal
PrOpCom	Promoting Pro-poor Opportunities through Commodity and Service Markets
PSRHH	Promotion of Sexual and Reproductive Health and HIV/AIDS Reduction Programme
PTDF	Petroleum Technology Development Fund
QPM	Quality Protein Maize
RBDA	River Basin Authority
RBM	Roll Back Malaria Program
RIDS	Rural Infrastructure Development
RTEP	Root and Tuber Expansion Program
RUSEP	Rural Sector Enhancement Programme
SACA	State Action Committees on AIDS
SAMEG	State Agro-Processing and Marketing Expansion Program
SFDO	State Fadama Development Office
SGR	Strategic Grain Reserves
SME	Small and Medium Sized Enterprises
SMOH	State Ministry of Health
SO	Strategic Objective
SOWESS	Social Welfare Services Scheme
SPFS	Special Project on Food Security
SSA	Sub-Saharan Africa
SSMU	State Seed Multiplication Units
STI	Sexually Transmitted Infections
SWAAN	Society of Women Against AIDS in Nigeria
TBA	Traditional birth attendant
TBL	Tuberculosis and Leprosy
UI	University of Ibadan
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNAIDS	United Nations Program on HIV/AIDS
USAID	United States Agency for International Development
VAD	Vitamin A deficiency
WB	World Bank

WHO	World Health Organization
WHTC	Withholding Tax on Contract
WOFAN	Women Farmers Advancement Network
YES	Youth Empowerment Scheme

Executive Summary

Nigeria is richly endowed with a high percentage of arable land, wide ranging agroecological zones, and abundant energy resources. Although Nigeria was self-sufficient in food before the oil boom in the late 1960s and early 1970s, the agricultural sector has remained stagnant since then, while a high rate of population growth has left the country a net importer of many commodities. Poverty, meanwhile, has reached 70 percent of the population, resulting in very serious food insecurity, especially in rural areas. The current economic environment in Nigeria paints no brighter picture for the average Nigerian. The Nigerian Government has recognized the poor state of the average rural household, and is focusing its efforts in accelerating growth in the agricultural sector.

This Food Security Assessment looks at the broad context of food security, in terms of availability, access, and utilization of food from an agricultural/economic, nutritional, and HIV/AIDS perspective. Food security is defined as access by all people, at all times, to sufficient food for a healthy and productive life. The availability and affordability of food is closely tied to the nutritional status of the average household. The biological utilization of food is adversely affected by HIV/AIDS. The impact of HIV/AIDS and other serious diseases on rural Nigerian households already jeopardized by limited agricultural production and means to maintain a healthy diet will significantly increase chronic food insecurity.

Economic/Agricultural Component

In spite of the dominant role of petroleum in the economy of Nigeria, agriculture still remains the mainstay of the economy, with well over 50 percent of the population involved in agriculture. Nigeria has enough food available to provide its population more than the minimum required kilocalories per day and energy requirements for each person to maintain a healthy and productive life. However, poor or inadequate government policies, weak government institutions, poor rural infrastructure, a stagnant agricultural sector, low literacy rates, and other factors have resulted in much of the rural population having serious problems in accessing and utilizing food.

Unstable macroeconomic policies, including weak fiscal policies with less than 2 percent of the federal budget invested in agriculture, inadequate monetary policies, and non-stimulative trade policies, have failed to induce the Nigerian economy to grow much faster than the population growth rate. Microeconomic policies, including agricultural input supply policies, credit policies, infrastructure development policies, land policies, gender and other policies, have failed to provide the necessary enabling environment for private sector development.

Subsistence agriculture accounts for 90 percent of agricultural output. Smallholder farmers, the major producers of all major food crops and livestock in Nigeria, employ traditional farming systems characterized by extensive use of land and the practice of shifting cultivation. In terms of agroecological zones, the Central Zone is considered the most productive zone with farmers in the zone producing the most yam, rice, and groundnuts, while also producing large quantities of maize and cassava. During the dry season, irrigated, low-lying, and river basin areas are used for crop production. Smallholder farmers in the South East zone produce the most cassava and

cocoyam of any zone, while also producing large quantities of yam. The North West zone dominates in the production of millet, sorghum, cowpea, and livestock (along with the NE zone), while also producing large quantities of maize, groundnut, and rice.

The Baseline Survey for the National Special Food Security Program found that rural households in three zones, the SE, NW, and NE, each had only an average of seven months of own production after which they had to purchase food. The SW and Central zones reported nine months and twelve months of own production, respectively. With low and continued stagnation in agricultural productivity across all zones, rural households rely on other sources of income in order to access the required levels of energy and protein for the household.

Disparities in access and utilization exist across zones and households. The disparities across zones in production, productivity, income, and nutrition are a result of various factors as given below:

Table 1. Disparities Across Zones, Causes, and Zones at an Advantage/Disadvantage

Disparity	Cause	Zone(s) with Advantage	Zone(s) at a Disadvantage
Production	Agroclimatic	SW, SE, C	NW, NE
	Soil Type	C	NW, NE, SE
	Amount of Arable Land	C	SW
	Amount of Cultivated Land	NW	SW
	Amount of Fadama and Irrigated Land	NW, NE	
Productivity	Farm Size	NW	SE
	Land Tenure	SW, SE	NW, NE
	Access to Inputs	None	
	Access to Credit	None	
	Cost of Production	NW, NE	SW, SE
	Incidence of HIV/AIDS and other serious diseases	NW	SE
Income	Farm Size	NW	SE
	Productivity	C	SW, SE
	Diversification	C	SW. SE
	No. Months of Own Consumption	C	SE, NW, NE
	Storage and Processing	NW, NE	SW, SE
	Market Prices	None	
Nutrition	Household Size	SW	NW
	Dependency Ratio	SE	C
	Farming System	C, NW, NE	SW, SE
	Diversification	C	SW, SE
	Income	SW, SE, C	NW, NE
	HIV/AIDS	NW	SE
	Food Deficiencies	SW, SE	NW, NE
	Women's Literacy Rate	SW, SE	NW, NE

The Federal Government has initiated intervention programs to address the interrelated problems of poverty alleviation and food security. The major programs include the National Poverty Eradication Program (NAPEP), Cassava Mosaic Disease Epidemic Prevention Program, Root and Tuber Expansion Program (RTEP), the National *Fadama* Development Program (NFDP) and the National Special Program on Food Security (NSPFS).

These programs along with many donor-funded programs and projects have focused on sustainably increasing farm and non-farm incomes through improved productivity and more efficient input and output markets. These programs also target improving food security, health, and nutrition, and the adoption of productivity and livelihood improvement options that equitably distribute the opportunities and benefits of pro-poor growth processes among target beneficiaries. The implementation sites of development and technology transfer projects, in particular, are on a pilot scale with limited geographical coverage. Consequently, the programs may have a local impact ,but are unlikely to be felt on a regional basis unless the projects are expanded significantly.

Nigeria does not exhibit need for an emergency food program, given that it is food secure at the national level. If used, processed or non-processed commodities imported under Title II would be monetized to fund development aid. There are two reasons why Title II interventions are not recommended in Nigeria: 1) There are no NGOs or cooperating sponsors in Nigeria who have the monetization experience necessary to administer and manage such a program successfully; and 2) The importation of commodities which are produced in Niger could lower prices and present a disincentive to local production.

The principal options for improving food security include:

- Establishing a more enabling policy environment for stimulating private sector development and growth in the agricultural sector;
- Enhancing agricultural productivity by expanding use of technologies proven to increase productivity and use of models of farming systems-based technology transfer activities to areas outside the pilot project sites; and
- Promoting agribusiness and agro-industrial development by supporting an agribusiness development project to assist in expanding the processing and industrialization of cassava and maize subsectors, the aquaculture industry, and the privatization and development of the country's abattoirs.

Nutrition Component

Nutrition is a multi-sectoral social issue rooted in a country's political, economic, and cultural dynamics. Access to the resources for economic production as well as to those for human reproduction, such as education and health care, is the basis of good nutrition in any society, and lack of access to those resources is the basis of malnutrition. Food security also is linked to how people can utilize food biologically, which includes their health knowledge and practices as well as their health status. Malnutrition compromises physical and mental capacity, decreases productivity, and is a factor in the negative cycle of poverty and food insecurity, including its intergenerational transmission.

Five major national surveys provide anthropometric data on Nigerian children during 1990-99. It is not possible to identify trends from these surveys because they used different sampling strategies, including measuring children of different ages (less than 3, 5 and 6 years) and analyzing and reporting their data in terms of different geographical regions (three, four, or five regions). The data from the different surveys therefore cannot be compared directly. Overall, however, the anthropometric data do show that rural children's rates of stunting, wasting, and

underweight are consistently higher than those of urban children during 1990-99. In general, the national averages show that:

- Stunting among rural children has been about 46 percent since 1990, versus 35 percent-42 percent in urban areas. The highest proportion of stunted children, up to 52 percent, is in northern Nigeria. The proportion in the southern areas is up to 39 percent. These regional proportions have not varied much from1990-99.

- There is little difference in the rural and urban wasting rates. The surveys report wasting rates of 10-13 percent in the rural areas and 7-11 percent in the urban areas. A larger proportion of children in the north are wasted than in the south.

- Rural underweight rates apparently have decreased to 28 percent during 1990-99, versus the urban rate of 20-27 percent. The regional disparity between northern and southern Nigeria is evident in this global measure of malnutrition: in 1999 up to 45 percent of children in the northwest were underweight, versus up to 25 percent in the southwest.

There is a close link between maternal undernutrition, infants' low birth weight, and childhood stunting and underweight. In 1999, 16 percent of Nigerian women were undernourished, based on their body mass index measurement. There was little difference in the proportion of undernourished women in rural and urban areas, but a larger proportion of women in the north, up to 25 percent, were undernourished, compared to 20 percent in the south.

Three micronutrient deficiency disorders are common in many parts of Nigeria: vitamin A, iron, and iodine. Vitamin A deficiency is a major contributory factor to high infant, child, and maternal mortality in Nigeria; it contributes up to 25 percent to mortality in children under five. In 1993, one-third of Nigerian children were deficient in vitamin A, 12 percent had iron deficiency anemia, and 2 percent were deficient in iodine. Children's vitamin A deficiency rates in the north were twice as high as those in the south, as high as 50 percent in the North East. That year 9 percent of Nigerian women were iron deficient, with a much higher proportion affected in the northeast, 20 percent, versus a maximum 10 percent in the south. Information on micronutrient deficiency prevalence and distribution patterns from the "Nigeria Food Consumption and Nutrition Survey 2001" will soon be available to update these figures.

Childhood illness is a major factor in malnutrition, and vice versa. Malnutrition reduces resistance to disease and disease contributes to poor nutritional status. The one-quarter of Nigerian children that are underweight are particularly vulnerable to the major causes of child death that are, in order, malaria, diarrhea, and acute respiratory infection. Lack of clean water and sanitation facilities also contribute to disease burdens and thus malnutrition.

The risk factors for childhood illness include lack of immunizations, antenatal care, and the amount of time mothers have to care for their children. Mothers' education is positively and consistently associated with children's health and nutritional status. In 1999, almost half of rural children under two had no immunizations, and 60 percent of these children had mothers with no education. About one-third of rural women did not receive any antenatal care in 1999, which made their infants vulnerable to health and nutrition problems before birth. The heavy burden of

agricultural production, reproduction, and high maternal mortality rates limit Nigerian women's time and capacity to provide adequate care and nutritional security for their children..

The options for improving food security from a nutrition standpoint include:

- Strengthening the National Committee for Food and Nutrition (NCFN), a key government institution responsible for developing nutrition policies and programs in Nigeria;
- Supporting the relocation of NCFN under the Presidency, where nutrition issues will have the critically necessary attention of the President and his Ministers;
- Supporting the participation of small and medium enterprises in fortifying flour and other commodities with micronutrients such as vitamin A;
- Assisting HIV/AIDS-affected people in accessing the medications and nutritional foods essential for them to remain productive as long as possible;
- Strengthening the government capacity for the systematic collection, analysis, and distribution of nutrition and health data;
- Improving the national nutrition surveillance system for monitoring child growth and nutrition;
- Promoting an education campaign aimed at educating women and children about key issues that affect child nutrition and the nutritional requirements of those afflicted with HIV/AIDS and other diseases; and
- Providing non-commodity support for the school feeding program of the Federal Ministry of Health's Department of Community Development and Population.

HIV/AIDS Component

HIV/AIDS has implications more serious than many other diseases. Nigeria is in the grip of a growing HIV/AIDS epidemic, with a reported national adult infection rate of 5.8 percent in 2001. Because of the time taken for individuals infected with HIV to develop full blown AIDS the number will almost inevitably continue to rise at least until 2015 when some 875,000 people will be directly affected. The cumulative total number of AIDS deaths by that time could be as high as 9.4 million Nigerian individuals. Under a high growth rate scenario these people would leave behind them some 5 million orphans and be responsible for about 46 percent of hospital bed occupation. This has implications for national security, for governance, and, of course, for food security. Given that this epidemic has its main impact in the most productive age group, these levels of infection have grave implications for food security in Nigeria. At this stage, while prevention interventions are important, they will not be enough. Mitigation interventions such as the use of anti-retroviral (ARV) therapies must be developed and implemented as a matter of the very highest priority.

This situation is made worse by the pre-existing extreme poverty experienced by a large portion of the Nigerian population. Poverty contributes to the spread of HIV/AIDS and exacerbates its effects.. The prospects of breaking out of this circle are bleak. Up to 25 percent of adult women and 57 percent of children under three are severely malnourished, and an estimated 70 percent of the entire population lives below the poverty line, i.e. on less than $1 a day.

The population's health status is further impacted by repeated occurrences of malaria in adults, throughout the country, and on the frequently fatal impact of malaria on children under five. Although those who survive to adulthood tend to develop a resistance to the morbidity of malaria, most in the rural areas will experience between one and three attacks a year. This not only implies days lost to productive activities, but also creates opportunities for other infectious diseases to enter the body while its ability to repel them is weak

In addition to malaria, Nigeria has the fourth highest rate of tuberculosis infection in the world. New cases notified in 2001 were roughly 10 percent of this total, leading the FGN to conclude that the detection rate was only 10-15 percent of the actual total. TB is one of the leading opportunistic infections associated with HIV/AIDS. The spread of the latter ensures that the national infective TB pool increases in size with implications for the wider population. Some of this TB will be multi-drug resistant.

Thus, the combination of TB, malaria, but above all HIV/AIDS means that:

- Agricultural diversification becomes problematic under conditions of reduced labor availability, quality and skills;
- Private sector development and vocational training become problematic as instructors, students and trainees are affected by illness and death and skill levels and returns to training and education are reduced;
- Direct income support and targeted programs have to focus on social support more than "development";
- Crisis prevention and emergency support become longer term as the epidemic and its impacts occur over a time period of around 30-50 years in the absence of ARV interventions;
- Economic infrastructure is affected at all levels and in most sectors;
- Environmental and natural resource management become difficult as rural infrastructure is affected by lower labor availability, less skilled labor and reduction of already scarce local resources;
- Market efficiency and trade policy market operations are affected by loss of key players such as indigenous credit providers and loss of key market participants from rural households; and
- Agricultural production and research: seriously affected at all levels as rural households have to accommodate labor loss from illness and death and research institutions lose key staff.

The HIV/AIDS epidemic in Nigeria appears to be affecting agriculture, household livelihood strategies and, hence, food availability and security. It affects food security by reducing household ability to maintain a diverse portfolio of activities, to produce food, and to generate income with which to buy food. It results in loss of assets and severe decline in the insurance value of social networks. The sicker the family member becomes, the more money is borrowed from relatives and friends. Experience elsewhere in Africa shows that a farming household's first response is to reduce the number and range of crops grown, usually substituting root crops with poor nutritional value for high value and nutritious crops. Observed choices have been the sacrifice of cash crops for food crops and leafy crops and fruits for starchy root crops.

Other labor economizing adjustments likely to be occurring in Nigeria include reducing the number of people considered eligible for mutual assistance within the "family", withdrawal of children from school, reduction of women's trips to the water source, extended and more intensive use of child labor. The HIV/AIDS epidemic compromises the accumulation and maintenance of many types of asset. Among these compromises is the care and husbandry of livestock. These are disposed of to generate cash for care and treatment of the sick, slaughtered for consumption during funerals, taken away from survivors by other family members, deliberately de-stocked because of shortage of labor, or they may die because of poor management. Loss of livestock implies loss of manure for the farm and loss of products such as milk, meat, and eggs for the family. It means liquidation of important savings for many households.

In many cattle-keeping communities, people share the care of their animals with friends and relatives over a wide geographical area. This reduces risk of loss in the event of disease or theft. As with reduced crop range on the arable side, so reduction of the range of domestic animals kept or withdrawal from such risk pooling arrangements are all symptoms of the way that AIDS makes a household, cluster or community more vulnerable to the next traumatic event.

HIV/AIDS may adversely affect the care of livestock and expose them to disease. The same may be true of crops, where poor human health means poor cultivation and ultimately disease and pest control. The HIV/AIDS epidemic may affect the practice of entire farming systems and human nutrition. Such changes may go unnoticed and unreported. Those whom these changes affect have little influence; and government and agencies lack the perspective to track events of this sort. It is of greatest importance that governments, multilateral and bilateral agencies take seriously the need to monitor farming system changes as a result of HIV/AIDS.

The options for mitigating the effects of HIV/AIDS and improving food security are very limited.

- HIV/AIDS prevention interventions are extremely difficult and take a long time with very mixed results, as evidenced by the explosion of infection in Africa. There is no reason to expect prevention programs to be more effective or rapid in Nigeria than elsewhere.
- Provision of food supplies to some areas, such as Benue, may be necessary in the short term but such relief activities will have to take account of the following: (a) the recovery process will be longer than expected and may extend to ten years (b) it is practically difficult to target only people and families affected by AIDS, since they will prefer to hide the affliction because of the stigma attached to the disease; and (c) affected individuals require easily digestible and nutritionally dense food products that are not readily available.
- The provision of anti-retroviral drugs is the primary policy intervention that can strengthen resilience and recovery capacity of affected individuals, and have an immediate and long-term effect on food security. . Establishment of a system to provide these drugs will also enhance capacity to address the TB and malaria problems. ARV treatment will ensure continuing availability of labor in the rural sector, continued care of children and most critically, that communities can reproduce themselves socially, economically and nutritionally. This policy will lead to development and independence rather than dependence and destitution.

Priority Options for Improving Food Security

The top priority options that address the greatest challenges for improving food access and utilization include:

- Support an agribusiness development project, such as, RUSEP, to assist enterprises and associations involved in expanding the processing and industrialization of the cassava subsector (SE), the maize subsector (Central), the aquaculture industry (SW,SE), and the privatization and development of the country's abattoirs (NW,NE). Support capacity building among smallholder farmer marketing associations and facilitate linkages with large processors and manufacturers utilizing cassava and maize products with the objective of developing contract farming in selected zones.
- Advocate for an increase in the federal, state, and local government's rural infrastructure budget and develop a plan for coordinating funding of road improvements among local government, state and federal programs. Such a plan would require a timely needs assessment of infrastructure at the local and state levels. It would also require concerted coordination among officials at the local, state, and federal levels, and other representatives from the public and private sectors. Such systematic planning and an immediate implementation program would result inimproved market access and send a signal to the private sector that the government is serious about commercializing agriculture. It is recommended that this policy advocacy program, which could be implemented within five years (i.e., roads completed), if approved by the Government of Nigeria, be extended initially to only three states, one in the north belt, one in the Central belt, and one in the south belt.
- Continue advocacy for full liberalization of the inorganic fertilizer market. USAID should continue to support efforts to get the fertilizer market liberalized and labeling and quality assurance programs instituted.
- Extend the cowpea-based cereal/cowpea intercropping system, an improved farming system for smallholder farmers, to Kano, Kaduna, and Katsina States in the NW, and Bauchi and Jigawa State in the NE zone. The extra cowpeas produced can be sold for cash and the cowpea fodder can be used as a high nutrient source to feed livestock during the lean months in February through May. The extra cowpea production stimulates employment of women and children, and the added nutrition from the cowpeas and livestock would be especially helpful for the HIV/AIDS afflicted in rural households.
- Support the establishment of marketing centers for targeted crops/livestock such as maize and rice in the Central zone, cowpeas and groundnuts in Kano and Bauchi in the NW and NE, plantains in Abia in the SE, sheep and goats in Katsina in the NW and Adamawa in the NE, and fish in Rivers in the SE and Oyo in the SW zones. The marketing center would be an extension of USAID's ongoing ICS project, already operating in many of these States.
- Support development of roots/tuber/maize/legume farming system research at both IITA and national institutes and the extension by RUSEP, or a RUSEP-like project, in collaboration with the ADPs, in the SE and SW zones. Support RUSEP in assisting the smallholder farmers in the SW (Oyo and Oshun States) and the SE (Abia and Enugu States) in diversifying their mixed farming system to include more legumes, livestock,

and plantains. Special attention must be paid in the design of the type of technology packages and the labor requirements of the appropriate diversification extended to households afflicted with HIV/AIDS. In addition, special focus must be made to train women and women's groups in these States in nutrition, food storage, food preservation, and food safety, and promote a village level supplement and fortification program in cassava and maize.

- Determine innovative ways for smallholder farmers and agroprocessors, especially women, to access microcredit available from interested commercial and community banks and integrate the microcredit program into the RUSEP and DAIMINA, and other USAID development projects.
- Support advocacy programs that call for more humane implementation of existing law or traditional custom on inheritance rights for women .
- Assess the cost/benefit of supporting a program that distributes anti-retrovirals on a subsidized basis to those afflicted by HIV/AIDS.
- Help strengthen government capacity for data collection and analysis in nutrition, agriculture, and HIV/AIDS and help extend the national surveillance systems in nutrition countrywide. Support the Federal Government in developing and implementing an Early Warning System for determining the most vulnerable households nationwide.
- Support the relocation of the NFCN to the Office of the President.

SECTION I

Introduction

In Section I, the Assessment begins by looking broadly at and defining food security followed by examining the types of food insecurity, the connection between poverty and food security, other causes of food insecurity, and then the linkages among economics/agriculture, nutrition, and HIV/AIDS and food security.

In Sections II through IV, an examination and an analysis are made of the role of economics/agriculture, nutrition, and HIV/AIDS in the food security issue in Nigeria. Within each of these Sections are options for improving food security. Finally, in Section V, recommendations are given to address the availability, access, and utilization issues and to guide the planning to improve the food security in Nigeria.

A. Background

Nigeria is richly endowed with talented human and material resources. The country, with its high percentage of arable land, wide ranging agroecological zones, and abundant energy resources, has the potential of becoming one of the largest economies in Sub-Saharan Africa. However, with about 70 percent of the labor force dependent mostly on agriculture for their income, and with very low agricultural productivity for 90 percent of the agricultural sector comprised of smallholder farmers, the agricultural economy remains subsistent and stagnant and about 70 percent of the rural households live in poverty and food insecurity. What has led this country to become one of the twenty poorest countries in the world is a result of woeful neglect of important sectors, principally the agricultural sector, and corruption.

Nigeria was self sufficient in food production before the discovery of oil in the late 1960s and early 1970s. The agricultural sector grew at a rate sufficient to generate more than 50 percent of the foreign exchange earnings and a significant proportion of internal capital through export and domestic sales of agricultural commodities. However, in the mid 1970s, the government skewed its investment and its policies in favor of the mining, construction, manufacturing, and service sectors and away from the agriculture sector. Agricultural development initiatives faltered and food and export crop production declined. By the end of the 1970s and early 1980s, the worsening food situation, with its attendant food price inflation, became severe. This trend continued until balance of payments problems in the mid-1980s forced Nigeria to accept the structural adjustment program, prescribed by the IMF.[1] Though the agricultural sector reacted favorably to the structural adjustment program and production rebounded in the 1984-1992 period, the high population growth rate, the lack of investment in agriculture, and the increasing percentage of the population dropping below the poverty line set the stage for the stagnancy in the economy and in agriculture up to the present.

As the country experienced ever increasing rates of poverty, the government paid little attention to the basic needs of the rural population. With little social and physical infrastructure in place,

[1] African Institute for Applied Economics, Nigeria: Macroeconomic Assessment and Agenda for Reforms, 2003.

decreasing rates of literacy, poor access to markets and income generating opportunities, the rural population, i.e. most Nigerians, became increasingly food insecure.

The current economic environment paints a gloomy picture of the future of food security in Nigeria. With the current low rate of economic growth; declining rates of growth in income per capita, agricultural growth, and farm income; increasing rates of unemployment, and population growth, rising trends in food price inflation, and declining purchasing power, an increasing number of Nigerians are becoming poorer and food insecure. Given this scenario, the Nigerian national policy makers are becoming increasingly aware of the dire consequences of a worsening food and fiber supply-demand gap. They have also come to the inescapable conclusion that their attempts to achieve growth and equity will have limited success if the pervasive unemployment, poverty, and food insecurity persist.

In recognition of this, the current Nigerian Federal Government Administration is focusing its efforts on accelerating agricultural sector growth to achieve sustainable household food security and alleviate poverty. In pursuance of this national objective, USAID has effectively assisted the Nigerian government through its programs in economic growth and agricultural development.

This Food Security Assessment looks at the broad context of food security, in terms of availability, access, and utilization of food from an economic/agricultural, nutritional, and HIV/AIDS perspective. This multi-dimensional perspective of food security emphasizes the complexity of the problem and the intersectoral linkages.

B. Broad Context of Food Security

According to the World Bank (1991), food security is defined as access by all people, at all times, to sufficient food for a healthy and productive life. USAID Policy Determination #19 (1992) recognizes the nutritional aspect of food security in its definition, which states “When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life.”

Implicit in the above definitions of food security are some pre-conditions of and conceptual linkages among the various components of food security, which need to be brought into focus. First is the adequacy of aggregate food supply to meet the food and nutritional requirements of the nation, regions within the nation and all households in the nation. It is important to note that adequacy of aggregate food supply does not guarantee food availability across regions and for all seasons. Efficient distribution and market mechanisms are needed to ensure that availability at the aggregate level translates into regional and seasonal food availability.

Second, food availability across regions and seasons does not assure food security of households and individuals within the household. Adequacy of income, and hence purchasing power, to acquire all or part of the food necessary to meet consumption and nutritional needs must be assured.

Third is the fact that household food security does not guarantee adequate consumption by all members of the household. There must be equitable distribution of food to ensure that all biological categories within the household are food secure. Based on some socio-cultural

practices in some countries, women and children are of lower priority in the allocation of choice food within the household. An equitable food distribution mechanism is that which guarantees sufficient food in both quantity and quality to all biological groups within the household.

In the broad context of food security, the food availability, access, and utilization components are addressed individually or in combination with others. Food availability refers to when sufficient food is supplied annually to the entire population as a result of domestic production, imports, carryover, or food aid. Food access refers to when all households and members within all households are able to consistently obtain food on a regular and wholesome basis. Food utilization refers to when all members of all households are able to consume sufficient energy and protein to maintain a healthy and productive life.

C. Types of Food Insecurity

Food insecurity can occur on a chronic, seasonal, or transitory basis. Chronic food insecurity can take place when a poor nation becomes permanently or consistently food insecure because of, for example, prolonged and sometimes irreversible damage to the national food production system resulting from failed policies, soil infertility, etc. Seasonal food insecurity occurs at regular and predicted times of the year. Transitory food insecurity occurs temporarily from natural emergencies, war, etc. In Nigeria, chronic and seasonal food insecurity is common as evidenced by the rate of stunting and wasting in both the rural and urban populations. Transitory food insecurity also occurs when market failures give rise to very high inter- and intra-seasonal price instability and variability across regions, states, and towns resulting in households unable to afford the food necessary to make them food secure. When emergencies strike a household, for example when the head of the household loses his/her job or gets seriously sick or injured, most households in Nigeria do not have sufficient assets and must employ various coping strategies. At the national level, the degree of transitory food security can be measured in terms of days, months, or years that a nation can cushion any shortfall in supply, either from inventory build up, imports, or transnational food transfer, as a result of occurrences such as drought, war, famine, social conflict, socio-economic, and socio-political circumstances.

D. Poverty and Food Security

Seventy percent of the rural population and 58 percent of the urban population lived below the poverty line in 1996, and it is unlikely that this situation has improved (FOS, 1999). Nigeria's population is poor not only economically but also in terms of its health, nutrition, and educational status, its food security, and its political voice. The rural population is poorer and more marginalized than the urban population, but that may shift as the latter accounts for nearly half of the population and continues to grow rapidly. Rural indicators are consistently worse than urban indicators: rural residence is associated with higher rates of poverty, illiteracy, malnutrition, morbidity, and mortality. Poverty affects all three aspects of food security: the availability of food, people's access to it, and their ability to utilize it. Poverty affects availability because low incomes limit access to the resources for economic production, which helps keep incomes low and people poor. In a largely agrarian society like Nigeria, lack of access to resources for agriculture such as credit and inputs has negative effects on production and income. The former affects food availability and security at the national and household levels.

Low incomes limit people's access to food. In 1996, about three-quarters of poor households' total real per capita expenditures were on food (FOS, 1999). In 1999, almost half of all Nigerian children were chronically malnourished, indicating that these expenditures were insufficient for a large proportion of the population. Households' major expenditures on food leave them without money for other basic needs that affect nutritional status: health care, housing (clean water and sanitation), and education. The large expenditure also leaves households without a cushion against the successive economic shocks. A food-secure household spends about one-quarter of its income on food and has enough left for its other basic needs that contribute to food and nutritional security. Widespread poverty makes many Nigerian households unable to access the food, health care, and safe environments they need for that security. This perpetuates the cycle of poverty, food insecurity, and malnutrition

E. Other Causes of Food Insecurity

Food security also is linked to how people can utilize food biologically, which means their health knowledge and practices as well as their health status. The utilization aspect makes food security broader than is generally recognized in Nigeria. Disease affects the biological utilization of food and can exacerbate poor nutritional status, which makes access to health care essential. The availability of health-care services and people's ability to pay for it, to some extent, depends on government investment in the health sector. Clean water and good sanitation are two key elements of utilization and many Nigerians lack both. Women's education is consistently and positively associated with good health care and nutritional status in children, but 40 percent of Nigerian women of reproductive age have not had any formal education. The net result for many Nigerians, especially rural people, is disease burdens in combination with inadequate food intake that leads to malnutrition. Malnutrition in turn compromises physical and mental capacity, decreases productivity, and is a factor in the negative cycle of poverty and food insecurity, including their transmission to the next generation.

Chronic sickness and ultimate death (from HIV/AIDS, TB, malaria, etc.) of an adult member has a serious impact on household production capabilities, including tending to the agricultural crops, and additional implications if it is the household head who is afflicted. The immediate direct effect is in the gradual loss of labor power from the infected person, but secondary effects are imposed on other members of the household who have to share in tending for the sick person, fetching medicines, and taking on as much of their work as possible. The process through which a family affected by HIV/AIDS goes through over time as the disease progresses has an alarming impact on, for example, household income generated, type and productivity of crops grown, and food security.

F. Linkages of Various Components to Food Security

Throughout most of sub-Saharan Africa, agriculture forms the backbone of the economy and is the most dominant sector in terms of population. However, the traditional methods of farming coupled with the small average size of farms, leaves little crop surplus left to stimulate industrial uses of the traditional crops grown. As a result, the raw or minimally processed products from smallholder farmers make their way to rural and urban markets, where they are purchased and prepared in traditional ways for consumption. The availability and affordability of agricultural products is closely tied to the nutritional status of the average household in these countries. In

Nigeria, four of the five agroecological zones are producing food at or near deficit levels for their indigenous populations. Although food distribution channels smooth the supply of agricultural products to cities and semi-urban populations, the nutrition of rural populations are particularly vulnerable to uneven supplies of agricultural products. Chronic food insecurity and malnutrition in rural households has established itself over decades of underdevelopment in agriculture in Nigeria.

The linkage of HIV/AIDS and other serious diseases to an already jeopardized rural Nigerian household with limited agricultural production and means to maintain a healthy diet has serious consequences for chronic food security. Not only does the household suffer available labor and income losses, the household must access more food for the afflicted. The draw on resources of a household trying to survive the consequences of HIV/AIDS infecting the head of household gets worse with time unless a protective shield of support for infected/affected households or anti-retroviral drugs can be arranged.

For as much as higher income should be a major deterrent for a household becoming food insecure, experience in many sub-Saharan countries states otherwise. HIV/AIDS afflicts many households (for example, in Botswana) that have relatively high incomes, oftentimes leading to a lost job, death, and indebtedness.

SECTION II

Economic/Agricultural Component

Nigeria is a large country with an estimated area of 923,768 square kilometers and a population of about 120 million people. The country has a comparative advantage in the production of a variety of crops and livestock enterprises in different agroecological zones, which range from humid forest in the south to Sahelian savannah in the north. The soil types and rainfall distribution, to a large extent, determine the farming systems in the different agroecological zones.

In spite of the dominant role of petroleum in the economy of Nigeria, agriculture still comprises about 40 percent of Nigeria's GNP. In the last two decades, however, the performance of the agricultural sector has faced serious challenges while the demand for food has steadily increased. The share of agriculture in the government's total expenditure declined rapidly and consistently from about 15 percent between 1981 and 1985 to less than 2 percent.

This Section highlights the factors that are impacting the level of food security in Nigeria, including the policy environment, the supply and demand for food, and the disparities in the economy and the agricultural sector across zones. At its conclusion, options for improving food security are presented.

A. Policy Environment

An essential prerequisite for maximizing the impact of the new agricultural policy is the existence of an enabling macro- and micro-economic environment and institutional support arrangements.

A1. Macroeconomic Policies

In Nigeria, fiscal policies have not stimulated growth in the economy, but have resulted in external and domestic debts estimated at more than $28 billion. Meanwhile, agriculture's share of the federal budget has decreased to less than 2 percent. The federal and state budgets for improving infrastructure in rural areas also need a major boost in order to stimulate development of the agriculture sector.

Ineffective management of fiscal policy, inefficiency in the financial markets, corruption in the government, and lack of transparency in the banking system have combined to reduce the effectiveness of monetary policies.

The performance of monetary policies from 1999-2001 was poor and below targets in most cases. The high and unstable rate of growth in money supply fueled inflation; GDP growth rates of about 3 percent were lower than what Nigeria needed to keep up with the 2.8 percent population growth rate and at the same time lower the poverty rate. Serious money market distortions and the depreciating naira have set the terms of trade against domestic producers of

goods and services, such as smallholder farmers who depend on imported fertilizer and other imports.

Import duties have been highly variable and have often been used to protect and promote domestic agricultural production. The Nigerian Government has maintained an export ban on some commodities, such as, sorghum, maize, millet, roots and tubers, groundnut oil, palm oil, and poultry products, not only to ensure adequate supply to meet expanding domestic demand for both food and industrial uses. Trade in Nigeria is severely hampered by inefficiencies in the ports, including excessive port congestion and delays, complex custom clearing regulations, and lack of transparency among the port procedures.

A2. Microeconomic Policies

The new agricultural policy in Nigeria (2001) emphasizes the following key features:

- The evolution of strategies that will ensure self-sufficiency in food production through improvement in technical and economic efficiency;
- Reduction of risk and uncertainties through the invigoration of the existing agricultural insurance scheme to protect farmer's investment and enhance access to credit through indemnity against losses;
- A nationwide, unified and all-inclusive extension delivery system under the Agricultural Development Programs (ADP);
- Encouragement of agroprocessing to add value, promote rural industrial activities and entrepreneurship and link farmers with markets; and.
- Provision of rural infrastructure, rural banking, primary health care, and cottage industries, to improve the rural landscape, stimulate agriculture and rural development, and encourage youths to return to agriculture.

Microeconomic policies in Nigeria have, however, not been effective in increasing producer access to agricultural inputs, expanding and improving infrastructure in agriculture, supporting higher investment in applied agricultural research and development, increasing resources for rural extension activities and technology transfer, facilitating greater access to agricultural credit, improving water resource management, or establishing effective land development and tenure reforms.

B. National Food Security

National food security addresses the availability of food to the population as a whole. A country is considered food secure on a national basis when at least 2100 kilocalories of energy, and 0.75 grams of protein per kg of body weight, are available per capita per day.[1] In the case of Nigeria, domestic agricultural production of the major food crops reached 99 million mt in 2000, agricultural imports were 4.5 million mt (97 percent of which was rice, wheat, fish, and sugar), and carryover of food crops was estimated at about 1,000,000 mt. Postharvest and marketing losses and non-food uses were estimated at 32 million mt and 15 million mt, respectively.[2]

[1] Nigeria: Macroeconomic Assessment and Agenda for Reforms, USAID/Nigeria Macroeconomic Assessment , 2003
[2] Layemi, J.K., The Nigerian Food Equation: Towards A Dynamic Equilibrium

Exports of food commodities totaled about 15,000 mt. Approximately 2413 kilocalories/day of food were available per capita per day, assuming a population in 2000 of approximately 114 million people.[3] In 1999, 2497 kilocalories/person/day were calculated to be available per capita per day. The World Development Report 2000 reported the food energy available in Nigeria to be 2609 kilocalories/capita/day in 2000.

Data on meat consumption since the 1990s is not available, however, the World Development Report 2000 stated the estimated grams of protein consumed per capita per day in Nigeria was 56 grams in 2000 and 50 grams in 1999. With a median age of 18 years in Nigeria and an average weight of an estimated 60 kg, the protein requirement per capita per day is about 45 grams.

These results indicate that the country has had enough food available to provide the minimum required kilocalories per day and energy requirements for each person to maintain a healthy life.

C. Supply Side Factors Influencing Food Security

C1. Agricultural Production and Productivity

C1a. National Agricultural Production

Total arable land in Nigeria is 56.5 million hectares. Low-lying (*Fadama*) land is estimated to be 3.1 million hectares. Since 1992, growth in total agricultural production and area cultivated has slowed to an average of only 3.5 percent and 2.7 percent, respectively, per year.[4] This rate of annual growth in production is just above the population rate of growth (2.8 percent) and far below the 7 percent-8 percent needed for reducing poverty and household food insecurity.[5] The greatest increase in production and area cultivated since 1992 has been with the pulses and vegetables[6]. The cereal crops have exhibited the lowest rate of growth in production and area cultivated. Since 1992, much of the increase in production of food crops has been the result of expanding the area cultivated.

In terms of the share of total production by crop types between 1984-88 and 1996-2000, the average total production of roots and tubers increased from 55 percent to 68 percent, pulses increased from 11 percent to 17 percent, and cereals decreased from 37 percent to 24 percent. The area cultivated in cowpeas, rice, and yams increased by 6 percent, 5 percent, and 5 percent, respectively, while the area cultivated in millet and sorghum decreased by 9 percent each.

Livestock, representing the second largest sub-sector in agriculture, are produced principally in the Central, NW, and NE zones. Livestock production, though having increased by 3.7 percent per year from 1984-1998, due in part to the substantial land area devoted to pasture, has had its growth rate constrained due to shortages of feed and veterinary services[7].

[3] FOS, Annual Abstract of Statistics, 2001.
[4] CBN, 2001
[5] DFID, PrOpCom – Design, 2003.
[6] Area cultivated was not available for vegetables.
[7] FMA.

Domestic fish production, of which about 88 percent and 5 percent is derived from artisanal fisheries and aquaculture, has increased about 6 percent annually since 1995.[8] Despite the increase in domestic fish production, about 55 percent of the total fish in the country is imported.

C1b. Agricultural Production and Productivity Across Zones

Subsistence agriculture accounts for 90 percent of agricultural output. Smallholder farmers, the major producers of all major food crops and livestock in Nigeria, employ traditional farming systems characterized by extensive use of land and the practice of shifting cultivation. Smallholder farmers intercrop cereals, root crops, and tubers with legumes using the following patterns.

Table 1. Cropping Patterns in Agroecological Zones

Agroecological Zone	Farming System
North West and North East	Predominantly cereal (millet/sorghum (Sahel)/maize (Sudan) and legume (cowpea, groundnut) intercropping
Central	Cereal (millet/sorghum/maize) and legume (cowpea, groundnut, yam, cassava, and vegetables) intercropping; rice (sole, mixed cropping)
South West and South East	Root/cereal/vegetable intercrops with yam, cassava, melon, and vegetables grown in mixtures with one another, and/or along with maize; plantain added as cash crop

Source: NAERLS and FMA/PCU, Field Situation Assessment, 2002.

C1c. Agricultural Productivity and Income Across Zones

The Nigerian Government considers increasing agricultural productivity one of the major elements in improving food security. Unfortunately, several factors have lowered efficiency, agricultural production capacity, and product quality, and have placed a tremendous strain on what labor is available in the rural areas. Inputs, particularly fertilizer and improved seeds, have not been readily available on time and in good quality since the late 1990s, and poor rural infrastructure has adversely affected market access. Consequently, net farm income to smallholder farmers has remained low.

With low and continued stagnation in agricultural productivity across all zones, rural households have had to continue to rely on other sources of income in order to access the required levels of energy and protein for the household. The trend in income distribution since 1986 shows a widening income gap between rural and urban incomes.

Expenditure disparities also exist between urban and rural households. The disparities are higher during the July-September period when rural households have their own produce to consume and more of their expenses are non-cash expenditures. The higher percentage of expenditure on food by rural households during the lean months is a problem faced by most smallholder farmers (except many of those in the Central zone) who are essentially net consumers.

[8] FMA.

C1d. Input Prices, Cost of Production, and Credit

Prices of inputs are high by world standards. Access to improved planting materials has only in the past few years been improving as many farmers are being contracted to produce and sell certified seeds. Fertilizer prices are still much higher than the world price. Smallholder farmers have had difficulty obtaining the quantity of fertilizer they need on a timely basis. Although the government disperses 120,000 mt of fertilizer/year distributed somewhat evenly across all states, the amount is very small relative to the demand. In 1999/2000, the total supply of fertilizer nationwide decreased to about 200,000 mt, only about 18 percent of the amount potentially needed if applied at recommended rates.[9] Agricultural chemicals, available but expensive, are used by some farmers when they recognize the problem in time. Labor accounts for about 65 percent of the total production costs. Land preparation, planting/digging holes, applying fertilizer, seed dressing, weeding, harvesting, and bagging require labor. For those smallholder farmers with only about 1 ha or less of land cultivated, hired labor is too expensive, so the household must provide all the labor.

In order to purchase these inputs, smallholder farmers need to be able to obtain production loans. Farmers typically have little awareness of where to go to get credit for their farming operations. Even when they are aware of formal credit sources, high interest rates and difficult terms for such loans discourage the farmers.

C1e. Output prices and Profitability

Input prices and output prices have a major impact on the profitability (gross margins[10]) of the different crop mixtures used across zones. The FMA/PCU's Farm Management and Advisory Services Handbook 2000/2001 indicates that, among seven sole or mixtures of crops examined, the highest gross margins (naira/ha) for traditional smallholder farmers was for maize/sorghum (N28,800/ha) and rice (N23,100/ha).[11]

Rural market prices of the major crops increased nationally an average of 26 percent annually from 1993 to 2001.[12] This average annual rate of increase in commodity prices in rural markets closely followed that of the rural consumer price index of 25 percent during 1993-2001.[13] Rural market prices, as measured by the rural food price index in each zone, vary considerably across zones. This wide-ranging pricing information illustrates product prices are much lower in surplus areas and without a good marketing and transport system, smallholders find it difficult to benefit from the higher prices in areas that are deficit in those products. A major gap in Nigeria's agricultural support efforts is the absence of a market information system.[14]

[9] Singh, H.B. and B. Ajadi, IFDC, Fertilizer Production and Marketing in Nigeria, 2002.
[10] Gross margin is the net income before payment of family labor
[11] FMARD, FAMAS, 2002.
[12] FOS, Annual Abstract of Statistics, 2001
[13] CBN, Statistical Bulletin, 1999.
[14] RUSEP, Needs Assessment Study for Market-driven Agricultural Technology transfer and Commercialization in Nigeria, 2002.

C1f. Nutritional Indicators Across Zones

Energy

The grain equivalent (in mt/year) for each food crop/commodity or product is estimated based on the appropriate conversion factor for that food type. To obtain the available kilocalories/day per person, the grain equivalent is converted into grams per year, multiplied by 3.6 (to convert grams to kilocalories), and divided by the population.

In 2002, producers in the Central zone produced at least 80 percent more of the major food crops (in kg/capita in grain equivalent) than producers in the NW and the NE, 280 percent more of the food crops than producers in the SE, and 411 percent more of the food crops than producers in the SW.

Protein

For obtaining primary protein sources in the zones, the production of livestock, cowpeas, and groundnuts was assessed by zone. Cattle, sheep, goats, and groundnuts were produced mostly in the Central and northern zones. Poultry was principally produced in the SW and Central zones. The highest production of cowpeas was in the NW and NE zones. The Central and NW zones dominate the production of protein-rich sources of food, as measured by the number of livestock/capita/year. The NE is next in terms of production of protein-rich sources of food, livestock, pulses, and fish (mostly from the Lake Chad Basin). The SW zone is not producing enough protein-rich foods to reach the minimum protein requirements, although artisanal fishing provides an additional source of protein. The SE zone is producing the lowest amount of livestock although artisanal fishing is an important source of protein. Comparing the level of energy and protein supplied by each of the zones clearly shows the Central zone producing far above its energy and possibly above its protein requirements.

C2. Labor and Land Tenure

C2a. Labor

Labor is a critical input in the traditional, subsistence farming system employed by smallholder farmers in Nigeria. These farmers plant very small areas at a time, using crude implements and labor-intensive practices. As a result, the demand for labor is generally very high at the time of planting, weeding, and harvesting.[15] Since the oil boom years, rapid urbanization has taken place, and farm labor shortages have become a chronic problem in the entire country, especially in the southern zones. The percentage of the workforce employed in agriculture has dropped from 59 percent in 1981-1985 to 45 percent in 1996-2000.[16] Hired labor shortages have driven up the cost of labor in southern states, such as Rivers State, to N800-N1000/day, making such labor unaffordable to the average smallholder.

Exacerbating the migration problem has been the poor agricultural productivity of smallholder farmers and the perception among young adults in farm families that the farm cannot support

[15] CBN, The Changing Structure of the Nigerian Economy and Implications for Development, 2000.
[16] CBN, ibid.

them and their livelihoods. Once the young adults in the family leave, many farm families are left with only aging parents and possibly the very young children who need to be in school. To decrease the migration from rural to urban areas, young farm family members need to be integrated into agricultural technical training and assistance opportunities offered to the rural households through the ADPs and other projects or programs.

Though the practice of shifting cultivation among subsistence farmers is still common, the ability of these families to handle the heavy labor requirements in such farming is being tested. For those families with high dependency ratios, including those families where the head of household is infected with HIV/AIDS, household labor shortages can lead to malnutrition and chronic food insecurity.

In the NE and NW zones, there is a different labor shortage. In rural Muslim families, the education level of the women is very low and, consequently, few improved technologies in agriculture ever reach these women.

C2b. Land Tenure

Population growth has led to a high level of fragmentation of land.[17] Consequently, despite the large expanse of arable land in Nigeria, acquiring a relatively large tract or tracts of land for farming remains an "arduous task owing to the existing tenurial arrangements."[18] The cumbersome land acquisition process and the insecurity of title due to fraudulent practices are some of the land tenure constraints to sustainable food security. There are sociocultural factors that prevent women from having title to land in many parts of the country. For most communities, ownership of farmland is acquired through paternal inheritance, thus women have historically had limited access to and control over land resources.

C3. Storage and Processing

"A significant quantity of the farmers' harvests (in Nigeria) rot because of lack of storage and processing facilities."[19] Simple, efficient, and cost-effective storage technologies for perishables, such as roots, tubers, fruits, and vegetables, have not been properly demonstrated in Nigeria as compared to the storage technologies for cereal grains and legumes. Consequently, post-harvest food storage losses are very high, approximately 40 percent for perishables, compared to cereal grains and pulses at about 15 percent. The humid tropical environment in the SE and SW also makes it more complicated to store successfully any crop. In the arid northern part of Nigeria, storage of crops is much less problematic.

The Government's Strategic Grain Reserve is a failure because so much of the storage burden rests on the smallholder farmer. Traditional storage facilities have certain deficiencies, including a low, elevated base giving easy access to rodents, wooden floors that termites could attack, weak supporting structures that are not moisture-proof, and inadequate loading and unloading facilities. Across agroecological zones, most farmers store only a portion of their crops for

[17] IFPRI, IITA, and UI, Assessment of the Nigerian Agricultural Policy, 2003.
[18] CBN, The Changing Structure of the Nigerian Economy, 2000.
[19] RUSEP, Needs Assessment Study for Market-driven Agricultural Technology Transfer and Commercialization In Nigeria, 2002

consumption, instead, selling part of their crop early to get cash to pay for their immediate financial obligations, including, in some instances, repaying the production loan to the middlemen. For smallholder farmers in the SE, NW, and the NE zones, the most recently harvested crop is completely gone within seven months.[20] As much as the farmers would like to get a higher price by storing after harvest, financial obligations often require that they sell a substantial portion at harvest

In the Central zone, however, farmers produce and store sufficient food crops to last the entire crop year. Those farmers who have access to timely and reliable market information in Nigeria are often handsomely rewarded for storage. There are many opportunities for expanding local markets through further processing and marketing efforts. However, in order to attract investment in further processing and marketing these products, government policies need to make the environment more enabling for private sector investment and adequate infrastructure needs to be put in place.

Another current problem in agricultural processing is getting information on the processing technologies disseminated. Only about 30 percent of the machines developed by the Government are commercially available and little information is available to the smallholder farmers about their usefulness and affordability. Capable private fabricators build these machines, however, they lack the necessary raw materials to build exact replicates of the prototype. Private sector involvement in encouraging more adoption of improved agroprocessing technologies has not had an impact, but there is potential for primary processors to supply processed agricultural products to companies such as Nestlé, Guinness, etc.

C4. Transportation and Distribution

The only significant means of cargo transport in Nigeria is via the road system. The railway system is not functioning despite numerous efforts to rehabilitate the system. No significant cargo is transported via the rivers in Nigeria and transport of domestic cargo along the coast is not significantly exploited.

In Nigeria, the highways connecting the larger cities are capable of handling large transport trucks. Feeder roads off the main highways are in poor shape and in need of significant repair. Farm-to-market roads are unpaved and pot-holed making transport of farm produce time-consuming and expensive. Because of the poor rural roads, perishable products are at risk of spoiling or at least, losing quality before they are sold in the desired marketplace. Given the state of farm-to-market roads, it is just as difficult for these smallholder farmers to receive farm inputs, such as fertilizer. The “Best Bet Plus” improved cropping system that recommends only three bags of fertilizer/hectare fits the various constraints (including transport) faced by smallholder farmers.[21]

The distribution of farm produce and processed products is a major concern in a country as big as Nigeria with such a wide range of agroecological zones. Large volumes of grain are transported south while large volumes of root and tuber crops are transported north to meet the

[20] MFA/PCU and FAO, SPFS – Baseline Survey.
[21] B.B. Singh, IITA, personal communication

growing demand for these products. However, the flow of farm products from one zone to another has not been quantified and market information is not being collected regularly enough to analytically derive the quantities of these products being supplied to the markets.[22]

C5. Imports

Average total imports of agricultural commodities into Nigeria increased by 7 percent between 1985-89 and 1995-99.[23] The trends in the three major imported commodities (fish, rice, and wheat), which represent an average of 83 percent of the total annual imports of agricultural commodities since 1985, are very different. Between 1985-89 and 1995-1999, frozen and dried fish imports have increased 41 percent, rice imports have decreased 57 percent, and wheat grain imports have increased 8 percent. Import duties on these commodities and others may change from one year to the next. As of 2002, the import duties on rice, wheat, and fish were 75 percent, 10 percent, and 5 percent, respectively.

C6. Non-Food Uses

Non-food uses of agricultural outputs in Nigeria result in an 18.4 percent reduction in the aggregate supply of food products. Such non-food uses include industrial (manufacturing) non-food uses, seed use, milling wastes, animal feeds, etc. The estimated percentage that goes for non-food uses from various crops is, for example, 55 percent for wet and dry milling of maize, 24 percent for sorghum, 31 percent of pulses, 16 percent of yams, and 9 percent of plantains ands bananas.[24]

D. Demand Side Factors Influencing Food Security

D1. Population Factors

The projected population for 2002 was 121,276,000.[25] The population of Nigeria has been growing at a rate of about 2.83 percent since the 1991 census.[26] The rural population in 1991, the latest official census, constituted 62 percent of the total population. The NE, NW, and Central zones have a much higher rural population than the SE and the SW zones, according to the latest official census. It has been estimated that the overall rural population has decreased to about 57 percent. Urbanization, then, is occurring at a rate of more than 1 percent of the population per year.

D2. Income and Purchasing Power

The projected per capita income for 2002 was approximately N29,000, which was equal to about $250/person. The average person in Nigeria, therefore, lives on less than $1/day/person i.e. lives below the poverty level.[27]

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[22] The Agricultural College at the University of Zaria was regularly collecting price information until 1999.
[23] Nigerian Ports, PLC
[24] Olayemi, J.K., The Nigerian Food Equation: Toward a Dynamic Equilibrium, 1988.
[25] FOS, Annual Abstract of Statistics, 1999
[26] FOS, Annual Abstract of Statistics, 2001.
[27] According to the CBN, the GDP per person was estimated to be $305 in 2000. In any case, the per capita income is less than $1 per day.

Since per capita income is so low, the purchasing power of the average Nigerian urban and rural households is limited. For urban households, whose cash income may be higher than those in rural households, about 60 percent of their income goes for food. For rural households, about 24 percent of their cash income is spent on food during the post-harvest months (July-Jan) and 56 percent is spent on food during the pre-harvest months (Feb-June) when farmers are net consumers in all agroecological zones except possibly the Central zone.

D3.Tastes and Preferences

With the continued rural to urban migration, the tastes and preferences for urban populations (an increasing percentage of the total population) is changing. Convenience foods and easier-to-prepare foods are becoming more popular as lifestyles in urban settings become more hectic. This means there are marketing opportunities for more processed and prepared foods, including snack foods. Many farm commodities can be processed and packaged to accommodate these changes in tastes and preferences. Some of this processing has already begun and many farmers and farmer organizations have benefited from supplying the quality products demanded by processors.

D4. Food Prices

The annual average consumer price index for food increased by 27 percent per year annually from 1994-1998.[28] These price changes closely followed the broader consumer price index. Annual food price indices are available on a state-by-state basis. There is tremendous variation (as much as 40 percent) in these indices across states. The annual rate of change in the food price index across states is highly variable since food distribution and marketing channels in many parts of the country remain thin and relatively inefficient.

D5. Exports

The average value of total annual agricultural exports increased by 70 percent between 1985-89 and 1995-1999. Exports of cocoa beans, cashew nuts, and gum arabic, the three largest agricultural export commodities, have averaged 41 percent of total annual agricultural commodity exports since 1985. Cocoa bean exports have grown only about 10 percent between 1985-89 and 1995-99. Cashew nuts and gum arabic have grown in 1999 to 7 percent and 4 percent, respectively, of total agricultural exports.[29]

The Government of Nigeria has banned the export of many of the staple crops produced domestically. However, illegal cross-border trade represents a large, unmeasured flow of staple products and other commodities out of Nigeria.

E. Disparities in Regional and Household Food Security

Disparities in access and utilization exist across zones and households. The disparities across zones in production, productivity, income, and nutrition are a result of various factors.

[28] FOS, Annual Abstract of Statistics, 1999.
[29] Ref: Nigerian Ports PLC

Table 2. Disparities Across Zones, Causes, and Zones at an Advantage/Disadvantage

Disparity	Cause	Zone(s) with Advantage	Zone(s) at a Disadvantage
Production	Agroclimatic	SW, SE, C	NW, NE
	Soil Type	C	NW, NE, SE
	Amount of Arable Land	C	SW
	Amount of Cultivated Land	NW	SW
	Amount of Fadama and Irrigated Land	NW, NE	
Productivity	Farm Size	NW	SE
	Land Tenure	SW, SE	NW, NE
	Access to Inputs	None	
	Access to Credit	None	
	Cost of Production	NW, NE	SW, SE
	Incidence of HIV/AIDS and other serious diseases	NW	SE
Income	Farm Size	NW	SE
	Productivity	C	SW, SE
	Diversification	C	SW. SE
	No. Months of Own Consumption	C	SE, NW, NE
	Storage and Processing	NW, NE	SW, SE
	Market Prices	None	
Nutrition	Household Size	SW	NW
	Dependency Ratio	SE	C
	Farming System	C, NW, NE	SW, SE
	Diversification	C	SW, SE
	Income	SW, SE, C	NW, NE
	HIV/AIDS	NW	SE
	Women's Literacy Rate	NW, NE	SW, SE

The production disparities across zones can be partially explained by:

- Rainfall in the northern Sahel region of the NE and NW may only reach 200 mm per year, plus the rains are erratic. The amount and the pattern of rainfall improves the further south one goes. The longest growing season is in the south.
- The drought and the desertification of much of the northern Sahelian zone in the NW and NE has lowered the soil fertility and lowered production potential. Soil erosion in the SE zone has adversely affected the soil fertility and production.
- The average percentage of arable land under cultivation in Nigeria is about 44 percent. The NW zone cultivates the highest percentage and amount of its arable land (68 percent). Most of the increase in production in the past decade has come as a result of expanding the area under cultivation.
- The NW and NE zones have the most available *Fadama* land and land under irrigation.

The productivity disparities across zones are explained in part by:

- The small average farm size throughout the country, but particularly in the SE where the average farm size is only 1 hectare.
- The land tenure system has left agricultural land highly fragmented and makes it very difficult for large tracts of contiguous land to be obtained. In addition, women have

little opportunity to acquire land through inheritance because of antiquated patrilineal land tenure policies, especially noted in the NW and NE zones.

- Difficulties in accessing inputs are a common problem across the entire country.
- In the NW and NE, many smallholder farmers are producing certified (cereal and legume) seed for sale and the supply of improved seed has improved. In the SW and SE, obtaining cassava cuttings that are mosaic free is necessary now that the mosaic virus has become a threat to cassava producers. However, the supply of cassava cuttings is dependent on multiplication efforts being coordinated among the stakeholders.
- Access to credit is difficult across the entire country.
- The cost of production for the various crops is highly dependent on the cost of labor. About 65 percent of the cost of production is for labor. If a household must hire labor, labor costs in the NW and NE are cheaper than in the SW and SE. Labor shortages exist in the SW and SE as there has been a significant rate of rural-to-urban migration of the population.
- The incidence of HIV/AIDS, which is about 5.8 percent in Nigeria. The incidence is highest in the SE zone, resulting in decreased availability of labor within the household, conversion to less labor-intensive crops, more work for the other household members to take care of the afflicted, and, consequently, less productivity.

The income disparities across zones are explained in part by:

- Farm size with the SE having the smallest farm size of 1 hectare. However, the cash income of the average household in the SE makes up for the small farm size. On the other hand, though the average farm size (3 hectares) is greatest in the NW, the cash income of the households in the NW is relatively low.
- Productivity in the Central zone is highest while the productivity in the SW and SE tends to be the lowest.
- Diversification in the Central zone is highest with cereals, roots/tubers, legumes, all types of livestock being produced. Diversification is least in the SW and SE.
- The number of months that the household has its own production for consumption. The NW, NE, and SE have only an estimated seven months of own production for consumption.
- Storage of cereals in the NW and NE is more reliable and efficient than storage of roots and tubers in, especially, the SW and SE. Even storage of cereals in the humid tropics in the SW and SE is more difficult than storing cereals in the dry NW and NE zones.

The nutrition disparities across zones are explained in part by:

- The average household size in the SW is only 4 while the average household size is more than 6 in the NW and nearly 6 in the NE. Where households are largest one also finds the highest percentage of stunting and wasting in children under five.
- The dependency ratio is highest in the Central zone. Despite the Central zone producing the highest amount of energy per capita per year in the zone, the high dependency ratio (104 percent) may partially account for the high incidence of food insecurity.

- Diversification of crops and livestock provides a household with additional sources of nutrition. The Central zone has the most diversified agriculture. The least diversification is found in the SE, which produces less of the common protein sources, such as livestock and legumes, than other regions. As a result, the SE has a low protein production per capita per year[30] (large net deficit) in addition to low food-energy production per capita per year.
- Cash income and nutrition indicators are lowest in the NW and NE, as measured by energy (kcal/cap/day) and protein (gm/cap/day).
- The incidence of HIV/AIDS is greatest in the SE and least in the NW.
- The education level of women in the NW and NE is low compared to the literacy rate in other zones. As the education level of women increases, the incidence of stunting and wasting of young children in the household, all else equal, decreases.

F. Current Programs/Projects with Potential Impact on Food Security

The Federal Government has initiated intervention programs to address the interrelated problems of poverty alleviation and food security. Bilateral and international organizations, especially UN agencies, have also shown considerable interest in socioeconomic and sociopolitical development of Nigeria through the implementation of various assistance programs and projects designed to reduce poverty and enhance food security. Conceptually, all the projects seem to focus on three interrelated prerequisites of pro-poor growth and food security, namely:

- sustainable increase in farm and non-farm income through improved productivity and more efficient input and product markets;
- improved food security, nutrition, and health; and
- adoption of productivity and livelihood improvement options that equitably distribute the opportunities and benefits of pro-poor growth processes among target beneficiaries, i.e., men, women, youths, and disadvantaged groups.

There is a need for widespread adoption of these innovations across all ecological zones if the investments in these projects are to yield appreciable food security dividends.

G. Feasibility of PL 480 Title II Interventions in Nigeria

Nigeria has had household food security problems for many years as evidenced by a growing population of malnourished children that are stunted and wasted. In deciding whether USAID/Nigeria should consider a PL 480 Title II intervention, an assessment needs to made of the impact on production in Nigeria when a food aid commodity is imported and monetized. A list of products that could be considered for Title II intervention in Nigeria would include wheat, maize, rice, vegetable oil, and powdered milk.

A feasibility assessment of PL 480 Title II intervention in Nigeria could include a comparison of pros and cons. The pros:

[30] However, the protein amount per person per year may be higher if fish from artisanal fishing by households were included

- Nigeria does have a growing percentage of food insecure households. Young children and mothers show the highest rates of malnutrition. An intervention such as Title II would relieve the suffering of these people, if the intervention was able to successfully target these most needy beneficiaries.
- There are commodities available that could be provided through a monetization program that are already part of the diet of the poor in Nigeria.
- By providing commodities that are already being imported, total supply in the country would be increased, prices would drop, and consumers would be better off.

The cons:

- There are no NGOs in Nigeria with the experience necessary to administer and manage a successful monetization program.
- Nigeria imposes an import tariff on many commodities in order to protect domestic producers. The increased supply of many non-processed commodities that could be provided under Title II would likely have a disincentive effect on their domestic production.
- If processed commodities (such as vegetable oil) were imported as part of the Title II food aid program, the increased supply of a substitutable edible oil may interrupt the flow of the major vegetable oils being marketed currently in Nigeria.
- Providing commodities that are already imported would compete with the private sector and make it very difficult for the private sector to function profitably in those subsectors.

Nigeria does not exhibit need for an emergency food program, given that it is food secure at the national level. If used, processed or non-processed commodities imported under Title II would be monetized to fund development aid. There are two reasons why Title II interventions are not recommended in Nigeria: 1) There are no NGOs or cooperating sponsors in Nigeria who have the monetization experience necessary to administer and manage such a program successfully; and 2) The importation of commodities, which are produced in Niger, could lower prices and present a disincentive to local production; such could be the case of rice were imported.

H. Options for Improving Food Security

Various options for improving food security include:

An Enabling Policy Environment

- *Infrastructure*. Advocating for an increase in the federal, state, and local government's rural infrastructure budget and developing a plan for coordinating the current budgeted and increased level of local government road improvements with that of the state and federal road improvement programs.
- *Agricultural Inputs*. Policy advocacy for full liberalization of the inorganic fertilizer market needs to continue.
- *Market Information System.* Strengthening the government capacity for data collection and analysis in agriculture, nutrition, and HIV/AIDS. Extending support in

the development of MIS to rural markets and villages in zones through price boards, mass media, and cell phones.
- *Early Warning System*. Supporting the Federal Government in developing and implementing an Early Warning System approach to determining the most vulnerable households nationwide (including vulnerability in relation to HIV/AIDS) and for monitoring crop production and profitability.
- *Land Inheritance.* Supporting advocacy programs that call for the humane implementation of existing law or traditional custom on inheritance rights for women (widowed from HIV/AIDS-related deaths).

Enhancing Agricultural Productivity

- Through the RUSEP or RUSEP-like program and the assistance of DAIMINA and the ADPs, support the widespread expansion of the cowpea-based improved farming system for household food security, income generation, and improved nutrition in the NW, NE, and Central zones in Nigeria. The farming system has been employed successfully by many farmers supported by the IITA/Gatsby Project. Also, support the extension of integrated poultry, pig, and fish production technologies within existing farming systems in SW and SE zones using least cost feed rations and improved feeding practices.
- Support the development of cowpea (and groundnut)-based improved farming systems (with roots/tubers/maize) research for the SE and SW zones. Use this and other research support to help strengthen the weak link that currently exists between national and international research institutes in Nigeria.
- Support association development efforts in the NW and NE zones for women and special groups (HIV/AIDS, orphans) to assist them with access to agricultural technologies and training, agricultural inputs, storage and processing methods, and marketing techniques.

Agribusiness and Agroindustrial Development

- Support an agribusiness development project, such as RUSEP, to assist enterprises and associations involved in expanding the processing and industrialization of the cassava and maize subsectors, in the aquaculture industry, and in the privatization and development of the country's abattoirs. Successful industrial development models in poultry and flour-milling industries can serve as prototypes for assisting the private sector in developing an integrated industry in cassava flour and modified starch production in the SE, maize-milling and industrial use processing in the Central zone, fish and shrimp culture in the SW and SE, and livestock abattoirs and cold chains for meat in the NW and NE.
- As part of the abovementioned agribusiness development project, support capacity building among smallholder farmer marketing associations and facilitate linkages with large processors and manufacturers utilizing cassava and maize products with the objective of developing contract farming in selected zones.
- Support the establishment of marketing centers for targeted crops/livestock such as maize and rice in the Central zone, cowpeas and groundnuts in Kano and Bauchi in

the NW and NE, plantains in Abia in the SE, sheep and goats in Katsina in the NW and Adamawa in the NE, and fish in Rivers in the SE and Oyo in the SW zones. The marketing center would be an extension of USAID's ongoing ICS project, already operating in many of these States.

SECTION III

Nutrition

A. Nutrition: A Multisectoral Issue

Nutrition is a multisectoral social issue rooted in a country's political, economic, and cultural dynamics. Access to the resources for economic production and for human reproduction, such as education and health care, is the basis of good nutrition in any society. Lack of access to those resources is the basis of malnutrition. Nutrition thus is a cross-cutting social issue that is shaped by socioeconomic factors such as political ideology, income distribution, and social inequities — not simply by biology and access to food. It is important to recognize nutrition's broad context and the fact that nutritional status depends on more than access to food, or household food security. Nigeria's political development has resulted in inequitable access to political power and economic resources that, despite the country's abundant natural and human resources, has left much of its population impoverished and malnourished. Nutrition in Nigeria must be seen in the context of Nigeria's political economy, which reflects government priorities and investments. Thus far Nigeria's political economy has allowed malnutrition to become a widespread problem without a strategic response. The question remains whether the political will exists to address malnutrition as the key social and development issue that it is.

Seventy percent of the rural population and 58 percent of the urban population lived below the poverty line in 1996, and it is unlikely that this situation has improved (FOS, 1999). Nigeria's population is poor not only economically but also in terms of its health, nutrition, and educational status, its food security, and its political voice. The rural population generally is poorer and more marginalized than the urban population; rural residence is associated with higher rates of poverty, illiteracy, malnutrition, morbidity, and mortality than urban residence. Poverty affects all three aspects of food security: the availability of food, people's access to it, and their ability to utilize it. In Nigeria's largely agrarian rural population, lack of access to resources such as credit and inputs for agriculture has negative effects on production and income. This affects food availability and security at both the household and the national levels. Low incomes limit access to food, health care, and healthy environmental conditions, all of which affect nutritional status. The net result for many rural Nigerians is disease burdens in combination with inadequate food intake that lead to malnutrition. Malnutrition in turn compromises physical and mental capacity, decreases productivity, and is a factor in the negative cycle of poverty and food insecurity, including their transmission to the next generation

One-quarter of Nigeria's children are underweight — malnourished due to a combination of short- and long-term malnutrition and environmental factors — which indicates that their households are food-insecure. By extrapolation one-quarter of Nigeria's population suffers from food and nutritional insecurity. A malnourished population tends to be intellectually stunted, benefits less from education, and is prone to illness and poor social behavior; in sum, it is less productive and more costly to the state than a well-nourished population. Food insecurity and malnutrition thus ultimately have a negative effect on Nigeria's human resources and its economy at the national level. The negative cycle is clear: Nigeria's political economy has

created significant food insecurity and malnutrition, and those problems will constrain the country's social and economic development.

B. Stunting, Wasting, and Underweight in Nigeria

Methodological differences in the five major national surveys of nutritional status prevent their direct comparison and establishing trends over time. All the surveys have methodological flaws that limit the utility of their data; more than half of the 1999 NDHS anthropometric data were discarded so the survey's figures may not be valid for the northern regions in particular and Nigeria nationally. The NFCNS anthropometric data were not available for this report. It is also important to note that differences in percentages may not be statistically significant.

According to the 1999 NDHS, almost half (46 percent) of children are stunted. It is not possible to make a definite conclusion about change in children's stunting rates over time based on the available data. The key findings on stunting are:

- In 1999 rural stunting rates were about 47 percent and higher than the urban stunting rates of 35-42 percent.
- The highest proportion of stunted children, up to 52 percent, was in northern Nigeria in 1999; the proportion in the southern areas was 35-39 percent. These regional proportions have not varied much since 1990, based on the two NDHSs and preliminary figures from the NFCNS.
- Chronic food insecurity and/or recurrent illness are reported to be the causes of Nigeria's high stunting rates.
- Mother's education is consistently and positively associated with better nutritional status in children. All the nutrition surveys report that the prevalence of stunting, wasting, and underweight is higher in children of mothers without any education than it is in children of mothers with any education.

The rate of wasting, or acute malnutrition, has fluctuated around 9-12 percent during 1990-99. Change in Nigeria's wasting rate over time cannot be clearly established due to the lack of consistent data, but the national rate of 12 percent from the 1999 NDHS is cause for concern. That survey concludes that wasting rates vary little in terms of background characteristics such as rural/urban residence and mother's education, but that there is a regional disparity. The figures from the other surveys generally support this conclusion. The prevalence of wasting in the northern areas was reported as 11-23 percent during 1990-99; in the south it was 6-14 percent.

Underweight is a global measurement that reflects the combined effects of chronic and acute malnutrition and environmental factors. The national prevalence of underweight has ranged from 36-27 percent during 1990-99. The generalities associated with stunting and wasting are found with underweight also: the prevalence rates are higher among children in rural and the northern areas, and among those whose mothers have no education. Underweight rates are lower among children in urban and southern areas, and among children whose mothers have any education.

- Based on the latest available national data from 1999, about 29 percent of Nigerianchildren are underweight.

- Draft data from a 2003 WHO survey indicate that 26 percent of children are underweight, which is close to the figure above (WHO, Integrated Management of Child Illness Unit Survey, 2003).
- WHO's draft data also indicate that underweight rates are highest in the northern regions, up to 40 percent in the North East, and lower in the south, up to 23 percent in the South-South.

Children's malnutrition rates are high in Nigeria, compared to six other countries in the region (Benin, Cameroon, Chad, Ghana, Niger, Senegal). Nigeria has the largest proportion of stunted children in the region, 46 percent, compared with the next-highest rates of 40 percent in Niger and 35 percent in Cameroon. Nigeria's 12-percent rate of wasting is the second-highest in the region, and its 27-percent rate of underweight is the fourth-highest (UNICEF, DHS and MICS data, electronic version). As UNICEF notes, these figures are shocking in a country with Nigeria's resources.

C. The Factors in Malnutrition and Its Distribution

C1. Poverty

Widespread poverty is one result of Nigeria's economic structure and a basic cause of food insecurity and malnutrition. Poverty is a multi-faceted phenomenon, and its many facets contribute to malnutrition. It is associated with the lack of resources (physical and human capital) to produce adequate food or the income to buy it, as well as the lack of education, lack of health care, and living in poor environmental conditions that all contribute to malnutrition. The social and geographical distribution of poverty thus underlies the distribution of malnutrition in Nigeria. Poverty most affects Nigeria's rural population in general and farming households in particular and nutritional indicators consistently show that the prevalence of all types of malnutrition is higher in the rural population than others. An analysis of the 1990 NDHS data showed that children's malnutrition rates were highest in the poorest quintile of households and lowest in the richest quintile, which illustrates the relationship between poverty and malnutrition (UNICEF, 2001). Sixteen percent of children in the two lowest income quintiles were underweight versus 5 percent in the richest income quintile (UNICEF, 2001).

UNICEF notes that low immunization rates, lack of access to water and sanitation, and lack of access to reproductive health services are "inextricably intertwined with poverty," more prevalent in rural areas, and ultimately contribute to malnutrition (UNICEF, 2001). HIV/AIDS also is a significant factor in both poverty and malnutrition, and one whose impact will increase over time in Nigeria: "It is no coincidence that the maps of HIV prevalence and malnutrition overlap. The HIV epidemic is increasingly driven by the very factors that cause malnutrition: poverty, conflict, and inequality" (Piot and Pinstrup-Andersen, 2002).

Lack of education is one factor that is strongly correlated with poverty according to the FOS poverty profile. In 1996 about three-quarters of poor households were headed by a person without any education (FOS, 1999). In 1999 three-quarters of rural men and women had no formal education, which probably was a contributory factor to their households' poverty and vulnerability to malnutrition. The widespread lack of education in Nigeria, which is greater among women than men, is important because mother's education is consistently and positively

associated with children's health and nutritional status, and with numerous other indicators of well-being.

C2. Household Food Insecurity

Household food insecurity is one major factor that contributes to malnutrition. However, it is important to recognize that household access to productive resources and food is only part of the equation that determines nutritional status: access to the resources for good health is equally important. Household food insecurity therefore is one, but not the only, and not necessarily the most important, factor that contributes to malnutrition.

In terms of the nutritional status of an individual household member, the issue is the quality and quantity of food that the individual receives. Food security at the household level does not necessarily guarantee food security at the individual level, because intra-household food distribution patterns can leave some household members without sufficient food. Tradition often gives men priority access to better quality and quantities of food, and restricts women's and children's consumption. Unequal food-distribution patterns in food-insecure households can have the same effect, so that some household members' intake is adequate and others' is not. Household food insecurity therefore is likely to have different effects on different household members' food intake and their nutritional status. It may particularly affect young children who are at a disadvantage in the competition for food with other household members and prone to illnesses that compromise their nutritional status. This leaves them vulnerable to malnutrition when it has its greatest impact on mental and physical development.

The 2003 NFCNS provides some specific information about household food security. It reports that 74 percent of households in the moist savanna (the central agroecological zone) are severely food insecure, as are 60 percent of households in the dry savanna (northern zone) and 43 percent in the humid forest (southern zone). Nationally, 57 percent of Nigerian households are severely food insecure; only 26 percent are food secure. Sixty-one percent of rural households are severely food insecure, as are 55 percent of households in medium and urban areas. Farming households are more food-insecure than others: 62 percent of households headed by farmers are severely food insecure and only 22 percent are "normal." More than half of the households headed by traders and artisans also are severely food insecure, as are 48 percent of those headed by civil servants. These figures indicate that a variety of household types are food-insecure, which is one factor that makes their members vulnerable to malnutrition.

C3. Health Satus and Access to Health-Care Facilities

Childhood illness is a major factor in malnutrition. There is a negative, synergistic relationship between malnutrition and disease that exacerbates both: malnutrition reduces resistance to disease, and disease contributes to poor nutritional status. For example, malaria contributes to anemia and diarrhea to the malabsorption of nutrients, so both illnesses affect nutritional status. The result of this vicious cycle is poor growth that leads to increased illness and death. The one-quarter of Nigerian children that are underweight are particularly vulnerable to the major causes of child death that are, in order, malaria, diarrhea, and acute respiratory infection. According to UNICEF (2001), "The data available on the prevalence of diarrhea, under-nutrition and under-five mortality show a strong interaction among all three."

The risk factors for childhood illness include lack of immunizations and antenatal care as well as malnutrition (NDHS, 1999). The percent of children less than two years old who were fully vaccinated fell from 30 percent in 1990 to 17 percent in 1999, probably due to the shortage of vaccines in Nigeria during 1996-98 (NDHS, 1999). In 1999, almost half of rural children under the age of two had no immunizations. About one-third of rural women did not receive any antenatal care in 1999, which left their children vulnerable to health and nutrition problems before birth.

More than half of Nigerian households live less than one kilometer from a health center, clinic, or hospital, and about three-quarters live within four kilometers of one such facility (NDHS, 1999). Rural/urban differences in the distance to health facilities is not in the NDHS, but the fact that one-third of rural communities have only seasonal roads is one factor that limits their access. Access does vary by region: 21 percent of the population in the North East, 11 percent in the North West, and 13 percent in the Central zones had no access to health services in 1999 (NDHS, 1999).

Cost, quality of care, education, and cultural values influence people's use of health facilities. The combination of fees, that have been charged since the late 80s, and a deteriorating economic environment has created an "insurmountable [barrier] for many Nigerians," and particularly for the rural poor (UNICEF, 2001). Health factilities' generally poor quality of care — poorly trained staff, lack of equipment, drugs, and hygiene — is worse in rural areas, which discourages utilization or compromises its effectiveness. Cultural values influence people's beliefs about healing and childcare, which in turn affect their use of modern health care. Traditional beliefs in spirits as the cause of illness and traditional medicine as an option for treatment, and women's secondary social status and lack of education, all affect the use of health-care facilities, especially in the rural population. The interrelationship of poverty, lack of education, traditional beliefs, and social marginalization makes rural people more vulnerable to illness and less able to treat it effectively. Health and nutritional status both suffer as a result.

C4. Water and Sanitation

Lack of clean water and sanitation facilities are linked to disease, which contributes to malnutrition. Diarrheal diseases often are the result of contaminated water, can start the vicious cycle of nutrient malabsorption and malnutrition, and account for 20 percent of the mortality in children under 5 years of age in Nigeria (UNICEF, 2001). Malnutrition therefore is a factor in deaths from diarrhea. Lack of sanitation facilities and poor hygiene practices (defecation near water sources and homes, lack of hand-washing) also spread disease and are linked to malnutrition.

C5. Maternal and Child Care

Maternal and child care includes women's health status, the time mothers spend with their children, breastfeeding practices, complementary feeding, and the cultural beliefs and practices that influence these behaviors. Nigerian women's "heavy burden of production and reproduction" and high maternal mortality rates limit their capacity to care for their children (PICS, 1994). Women's responsibilities include children's health, preparing meals, and providing a clean home. However, the dual demands of work and childcare leave women with

less than four hours per day for childcare, which is insufficient (PICS, 1994). The lack of good alternatives for childcare — leaving young children in the care of other children, for example — has a negative effect on children's nutritional status (PICS, 1994).

The consensus of the national nutrition surveys is that infant and child feeding practices in Nigeria generally are not appropriate for good nutrition. Traditional beliefs delay breastfeeding after birth and prohibit giving infants colostrum. Tradition and/or women's economic responsibilities lead to low rates of exclusive breastfeeding (EBF) and the early introduction of complementary feeding. Although 96 percent of infants in Nigeria are breastfed, the median duration of EBF is less than one month and that of full breastfeeding (breastmilk and plain water) is just over two months (NDHS, 1999). The timing and type of complementary foods given to infants can have "a profound effect on their health and nutrition" and the consensus is that complementary feeding begins too early in Nigeria (NDHS, 1999; PICS, 1994; UNICEF, 2001). This exposes infants to infection and lowers their immunity to disease, which affect nutritional status. Giving food such as water and glucose before breastfeeding is a common practice that compromises infant nutrition; 85 percent of mothers did so in 1994 (PICS, 1994). Forty-four percent of infants 4-6 months old are fed cereal and 38 percent are given liquids other than breastmilk (NDHS, 1999). Supplementary foods are mainly unenriched carbohydrates (PICS, 1994). These feeding practices are a major factor in poor infant nutrition and point to the need for education for women.

D. Options for Improving Food Security and Nutrition

The following options to improve nutritional and food security are condensed for this summary; the complete version is in the Nutrition Component Section of Volume Two. It is important to note that the consistent response to the question of how to improve food and nutritional security was: "increase agricultural productivity." Both expatriates and Nigerians reported that increasing agricultural productivity would largely resolve the problems of the availability of and access to food in Nigeria, and thus malnutrition. Interviewees did not address the utilization aspect of food security and the potentially negative effects of HIV/AIDS on Nigeria's labor supply, although the latter is critical for increasing agricultural productivity. This is a very narrow view of food security and malnutrition and how to address both. The options below are aimed at the broader range of factors that affect nutritional status that USAID's program could address.

- *Strengthen the National Committee for Food and Nutrition.* The consensus is that the NCFN is being revived and is the key government institution to strengthen, despite its problematical history. The committee's newly appointed nutritionist will need support for advocacy. The NCFN needs strengthening and support to provide strong leadership for improved nutrition in Nigeria.

- *Relocate the NCFN under the Presidency.* The NCFN should be under the Presidency, as NACA is for HIV/AIDS, and USAID should support the move. FGN involvement in nutrition is critical; the presidential and ministerial levels must be engaged. Relocating the NCFN under the Presidency is necessary to get nutrition and its critical issues on the national agenda, which is necessary to mobilize the attention, funding, and action required for progress.

- *Coordinate policy-making.* Improve government understanding of the spiral effects of policy and the need for coordinating policy in order to avoid unforeseen, negative effects on food security. The obvious issue in Nigeria is the spiral effect of policies for oil that drive the national economy and ultimately affect all three components of food security — availability, access, and utilization.

- *Nutrition and HIV/AIDS.* Nutrition and HIV/AIDS are two parts of a single problem that must be addressed as part of improving Nigeria's food security. The HIV/AIDS epidemic in southern Africa has shown that the maps of HIV prevalence and malnutrition overlap, and that both are driven by poverty, inequality, and conflict. The distribution of malnutrition and HIV/AIDS most likely overlaps in Nigeria also. HIV/AIDS-affected households need support to access production technologies and economic options to help them maintain their food security, and HIV/AIDS-affected people need access to the food and medications necessary to help them remain well nourished and productive as long as possible.
- *Build capacity for government data collection.* The need to strengthen government capacity for the systematic collection, analysis, and distribution of nutrition and health data is critical. The data-collection system should include a geographical information-based system to collect data on environmental factors, agricultural production, and HIV/AIDS prevalence in order to map regional vulnerability to food insecurity. Capacity building should be done through the FGN and its civil servants with the objective of strengthening existing government institutions.
- *Monitor child growth by bringing the nutrition surveillance system up to scale.* The national nutrition surveillance system needs support to expand the system and the national database on child growth and nutrition. A standardized methodology should be used throughout the country so that the data can be aggregated for analysis at different levels. This would provide feedback at the community level about the effectiveness of or the need for local health/nutrition programs; the aggregate information would serve the same purpose at the state and higher levels.

- *Increase demand for nutrition services.* One of the health/education SO's activities will be to increase communities' demand for health and education services and their capacity to advocate on these issues, including the development of advocacy tools. Raising awareness about the importance of nutrition education and services, such as growth monitoring and micronutrient supplementation, could be part of this activity.

- *Educate women.* The consensus is that educating women about key issues that affect child nutrition is essential for addressing widespread child malnutrition in Nigeria. The options to do this include using the "positive deviance" community-level approach and/or providing a standard package of information and health-care services related to child nutrition as part of USAID's family-planning program for women. USAID should design this standard package in collaboration with the FMOH and promote its use in local health-care facilities, to broaden the work of improving nutritional security.

- *Nutrition education for children.* A nutrition-education component could be designed and included in USAID's basic education program for children, which currently operates in

Lagos, Kano, and Nasarawa states. School gardens would be an option for practical education about dietary diversity and vitamin A foods.

- *School feeding programs.* The FMOH's Department of Community Development and Population Activities is planning a school-feeding program and looking for partners to support it. USAID could provide non-commodity support for the program, and provide nutrition-education for women and children in the communities where it operates.

- *Community-based child growth monitoring: the Honduras "Integrated Attention to Children" Model.* Ten years ago Honduras implemented a community-based, child-growth monitoring system that has been successful at maintaining good nutritional status in children under the age of two. The system monitors children's weight in order to detect growth faltering as an early warning sign of malnutrition at the individual level, and to detect when it becomes a problem at the community level. Educating mothers about how to use the resources they have available for children's good nutritional status is a major component of the system. The overall finding is that accurate monitoring, mother's appropriate use of available resources, and prompt responses to community-level problems has contributed to maintaining good nutritional status in young children in rural communities. The Honduran government's long-term investment of time and resources is reported as the key to making this system a success. This system could be adapted to Nigeria, based on government commitment to a pilot program.

- *Supplements and fortification.* The current efforts to provide vitamin A supplements and the options of fortifying flour, sugar, and oil should be supported. One option in fortification is to promote the participation of small and medium enterprises that would make fortified flour readily available in rural areas. The sustainability of universal salt iodization should be maintained by ensuring the commitment of the salt producers and government agencies to implementing the policy. Iron and folic acid supplementation to all women and children at risk should be supported.

- *Off-farm income generation.* Small-scale income-diversification opportunities would have a positive effect on household economic and food security. The economic growth/agriculture SO includes adding value to agricultural products and creating opportunities for women for income generation by improving post-harvest processing. These are good options for simultaneously improving food security by improving access, and supporting the off-farm activities that already are an important component of the rural household economy, particularly for women. Another option would be to provide technical assistance to develop additional off-farm activities that fit into rural households' economic systems. This would provide a counterpoint to the universal focus on increasing agricultural productivity as the key to food security.

- *Increase agricultural productivity.* Increase agricultural productivity, including diversifying crop production to support dietary diversity, as well as improving storage and processing techniques, marketing networks, and roads. Low-cost, labor-saving technologies for HIV/AIDS-affected households will be necessary as Nigeria's affected population increases. It is important to recognize that HIV/AIDS in Nigeria will be a constraint on increasing agricultural productivity, because it will decrease the availability and productivity of rural labor and thus decrease food production and the availability of foodstuffs.

SECTION IV

HIV/AIDS Component

A. Overview: HIV/AIDS and Food Security

Nigeria is in the grip of a growing HIV/AIDS epidemic, with a reported national adult infection rate of 5.8 percent in 2001. More than 3 million Nigerian adults between the ages of 15 and 49 have already been infected with HIV and most of them will no doubt fall ill and die. Given that this has the most marked effects in the most productive age group, these levels of infection have grave implications for food security in Nigeria.

The implications of this situation is that the policy and intervention paradigm must alter to take account of dramatic changes which are now in place but the effects of which will endure for many decades to come. Sustainable improvements in household and national food security becomes difficult to maintain in an HIV/AIDS endemic environment:

- Agricultural diversification and production becomes problematic under conditions of reduced labor availability, quality and skills.
- Private sector development and vocational training becomes problematic as instructors, students, and trainees are affected by illness and death and skill levels and returns to training and education are reduced.
- Direct income support and targeted programs have to focus more on social support than on "development."
- Crisis prevention and emergency support becomes longer term as the epidemic and its impacts occur over 30-50 years in the absence of anti-retroviral (ARV) interventions.
- Economic infrastructure is affected at all levels and in most sectors.
- Environmental and natural resource management becomes difficult as rural infrastructure is affected by lower labor availability, less skilled labor, and reduction of already scarce local resources.
- Market operations are affected by loss of key players such as indigenous credit providers and loss of key market participants from rural households.

There are effective clinical interventions that prevent and slow the progression of HIV/AIDS, involving the use of ARV therapies. These are expensive and require clinical and laboratory support. However, the therapies save lives, and by extending productive lives they will undoubtedly have an important role to play in any food security strategy[1]. By providing hope for those infected, ARV is an important additional component in a prevention program.

A1. HIV/AIDS in Nigeria

Information on the national prevalence of HIV/AIDS in Nigeria depends almost exclusively upon a series of sentinel surveillance studies, the last of which was held between August 13,

[1] The latest thinking with regard to provision of ARVs in resource poor environments is to be found in Moatti, Barnett, Souteyrand et al (eds), *Economics of AIDS and Access to HIV/AIDS care in developing countries: issues and challenges*, Agence Nationale pour Recherche sur le Sida (ANRS), Paris, July 2003.

2001 and October 11, 2001. Data from that survey showed a median rate of infection of 5.8 percent for adults aged 15-49. This was an increase of only 0.2 percentage points since the previous survey in 1999, and which taken at face value indicated a slowing down of the rate of growth of the epidemic since 1991 when the rate was 1.8 percent, 1994 when it was 3.8 percent and 1996 when it was 4.5 percent.

A2. Tuberculosis in Nigeria

There have been no national surveys on the incidence of TB in Nigeria. For sub-Saharan Africa (SSA) as a whole, an annual risk of infection of 1.5-2.5 percent is usually assumed. If the lower boundary of this range is taken to provide a minimal benchmark for Nigeria, the number of TB cases appearing on a yearly basis would be 180,000, of which some 40-50 percent would be smear positive. The degree of TB opportunistically associated with HIV/AIDS has risen from 2.8 percent in 1991 steadily to 17 percent in 2000. The growing number of cases where TB allied with HIV/AIDS is likely to significantly raise the estimated mortality rate of 7 percent[2].

A3. Malaria

Malaria is highly endemic in Nigeria with a prevalence rate of 919/100,000. According to the Ministry of Health, it is of "a uniform epidemiological type characterized by high and stable transmission in all parts of the country"[3]. The major variation across the different zones lies in seasonality factors, whereby in the coastal rain forest regions the disease is endemic throughout the year in contrast to the far north where it is dormant during the prolonged dry period characteristic of that area, only to become highly active during the periodic rains. Transmission of malaria is higher in rural areas, where it is classed as holo-endemic, than in urban areas where it is meso-endemic.

B. Links between HIV/AIDS, Tuberculosis, Malaria, Nutrition, and Food Security

The manner in which HIV/AIDS, TB, malaria, and nutrition have been introduced in this report and their incidence summarized for Nigeria is typical of much of the way in which they are discussed in the literature: that is, independently of each other. But, of course, for the individual man, woman, or child diseases do not always occur in isolation. Only belatedly is the literature on HIV/AIDS coming to recognize these interactions, while in other areas such as agricultural production and broader aspects of food security there is still some way to go. As with all such interdependent cycles of cause and effect, it is difficult to know where to commence analysis and how to engage in positive intervention.

Let us start with HIV/AIDS. The virus produces a relatively short incubation period of several months, followed by a prolonged period of 5-10 years, if untreated, in which the infected individual's immune system is gradually eroded. This exposes a vulnerability to other opportunistic infections, of which the most common is TB. Many adults have carried the TB bacterium, *Mycobacterium tuberculosis*, since childhood, and while the normal bodily immune system keeps it suppressed, the gradual ascendancy of HIV creates the opportunity for TB to emerge, with the result that in Nigeria in 2001 some 17 percent of TB cases were found to be

[2] FMOH, National Tuberculosis and Leprosy Control Programme, *DOTS Expansion Strategic Plan 2002-5*, Abuja 2001
[3] FMOH, *Burden of Malaria in Nigeria* (offprint) 2001

HIV positive. In Africa about 40 percent of people with HIV infection may be expected to develop TB, normally occurring earlier in the course of HIV infection than other opportunistic infections such as fungal infections, intestinal infections, and pneumonia.[4] In one respect TB is more pernicious than the others as it can also be readily transferred to non-HIV positive residents of the same household.

The process of gradual debilitation as HIV evolves into AIDS is accelerated by inadequate nutrient intake, often with poverty as a primary cause, but aided by loss of appetite, inefficient digestion, reduced metabolism, and poor absorption, all side effects of the progress of the HIV infection itself, and compounded by endemic malaria. It is evident that an HIV-infected person is caught in a vicious circle of malnutrition and opportunistic disease, into which HIV adds an additional dimension of vulnerability with drastic consequences.

Problems are compounded by the effect of repeated occurrences of malaria in adults, throughout the country. Those who survive to adulthood tend to develop a resistance to the morbidity of malaria, though most in the rural areas continue to experience 1-3 attacks per year. This not only implies days lost to productive activities, but also creates opportunities for other infectious diseases to enter the body while it is weak. The progression of the HIV virus in infected individuals also accelerates during these periods. Increasingly, the individual with HIV finds it less easy to shake off each attack of malaria, which weakens the body's resistance further, and, in a deeper plunge of the downward spiral, permits latent TB bacteria to emerge.

C. Impact on Agriculture and Consequences for Food Security

The 'normal' situation of the majority of rural households in poor countries is where two or more adults share a range of subsistence and money-making tasks, assisted by children according to age and whether attending school or not. The more arduous tasks, involving short periods of high energy, tend to be undertaken by male household members while repetitive tasks which are less dependent on physical strength tend to be carried out by female members who are also universally responsible for the daily welfare of children, cooking, and household management.

In Nigeria, such a household will typically be operating at a level close to or just above the minimum necessary for survival, with little in the way of assets that may provide a safety net in the case of a disruption to normal productive activities. The impact of HIV/AIDS on a household that is only just keeping its members above the poverty line is to drag it below as the ability to produce food in sufficient volume and nutritious value, or ability to earn cash from occasional laboring diminishes. The extra hours worked by those who remain fit, the decrease in nutritional intake, and the decline of the home environment all create an atmosphere in which disease and illness may more readily strike the family. Even without the presence of HIV/AIDS, in such an environment tuberculosis is more likely to surface and malaria is less easily shaken off, while the individual infected by HIV finds that progression to AIDS accelerates as his/her resistance is eroded from within by the virus and without by the decreasing productivity of the household.

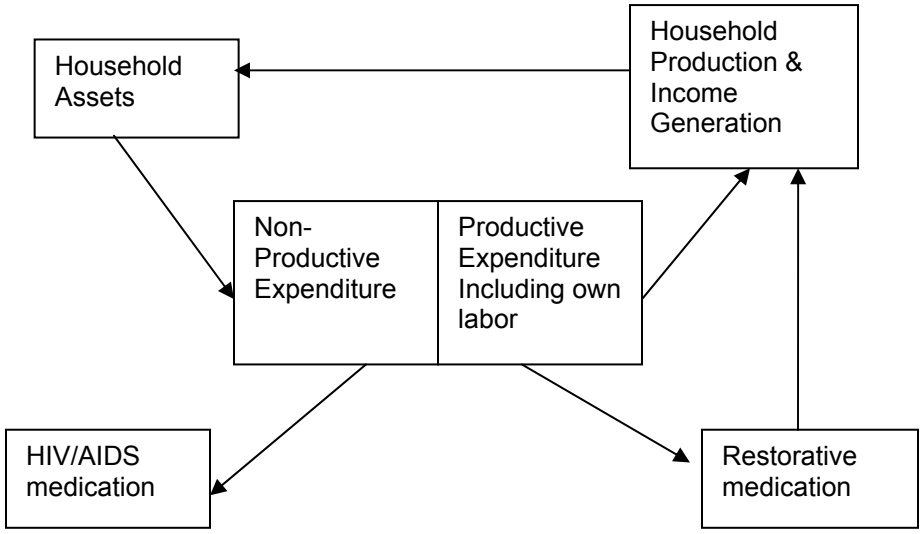
[4] UNAIDS, *Tuberculosis and AIDS*, Best Practice Collection, October 1997

We have focused here on the impact of HIV/AIDS at the household level, in an agricultural community, but the consequences at the national level could have wider implications for food security if it means a reduction in marketable output by those households who had been able to produce a small surplus.

D. Impact of HIV/AIDS, TB, and Malaria on Income Expenditure and Production

An overview of the relationship between production, generation of income, and expenditure for any household is given below. It displays how these three components of household economic activity are aspects of a single flow of resources upon which the ongoing sustainability of the household depends. A minimum productive expenditure and labor input is necessary for the required levels of food production and income generation for the household to survive at a constant standard of living from one period to the next. Any repeated leakage from this flow, such as the various costs involved in treating long-term adult sickness will send this circular flow of income and production into a downward spiral that may be irreversible.

Figure 1. Circular Flows of Household Income, Production and Expenditure



D1. Impact on Household Production

The variety of crops and production patterns found in Nigeria is highly varied across the three main agroecological zones and as such, the effects of HIV/AIDS and opportunistic diseases are likely to be variable. Households affected by chronic illness of key adults will respond by adjusting their cropping and livestock pattern to match the time and energy that they have available. There will be a shift from more demanding crops such as yam and maize to roots and cereals, which are easier to manage such as cassava and sorghum.[5]

[5] KIT, DFID Planning Mission of the Impact Assessment Study of HIV/AIDS on Rural Livelihoods in Benue State, Nigeria, (Draft Report) May 2002

Much will depend not only on the types of alternatives available but also on who traditionally supplies the key inputs. The manner in which HIV/AIDS affects women is likely to have considerably more impact on food security than any effect on the men. Given that a greater proportion of women are projected to become seropositive in rural areas in Nigeria, this is a matter of concern. The replacement of adult labor by that of children or elderly will also reduce productivity; yields per hectare of various crops will gradually diminish and more labor-intensive crops will be replaced.

The advance of HIV will tend to have increasing effects on agricultural activities as the disease progresses. At the early stages the most frequent impact will follow from generally decreased lack of energy to bouts of minor opportunistic ailments that last for a week or more. As HIV progresses, the period of illness and recovery time will become longer. By the time TB or malaria has appeared in an adult, it is likely that the resulting decline in production will already be far advanced.

D2. Impact on Household Income

For farming households specializing in market maize or yam production, the marketable surplus will be considerably reduced and hence money income decreased. The scope for continued purchase of nutritionally favorable foods will be reduced.[6] In both cases (production for subsistence and for sale) the household is exposed to the downward spiral of malnutrition, opportunistic infection, acceleration of HIV, and eventual dissolution. Potential to earn any income from other sources such as petty trading, casual labor, pottery, knitting, and weaving will be diminished and any earnings will be spent on cheaper and less preferred foodstuffs.

An additional factor that may considerably intensify the negative impact on income stems from the high levels of social stigma that continue to be experienced by persons living with HIV/AIDS (PLWHA) or suspected to have AIDS. Such people often find others unwilling to employ them or to buy their produce, for fear of contracting the disease themselves.

D3. Impact on Household Expenditure

It is evident from the preceding paragraphs that the negative effects of HIV/AIDS and opportunistic infections on production and income will inevitably affect expenditure. However, it is not only the level of income and production that is relevant, but the pattern of expenditure itself as an increasing proportion of available income is spent on medication and visiting clinics. Funds to purchase medication are beyond the means of families in moderate or extreme poverty, and the expense can push other families (such those of office workers, shop assistants, primary school teachers) closer to these levels.

[6] GON, *Food Consumption and Nutrition Survey 2001*

E. Nutrition Care and Support Needs of PLWHA and Affected Households

E1. Nutritional Deficiencies and Requirements

In order to fight and delay the transformation from HIV-positive status to AIDS, an infected adult is estimated to require an additional 10-15 percent of energy intake per day plus 50-100 percent additional protein, compared with that normally required for a healthy adult. These are demanding requirements for Nigeria where average caloric intake is considerably lower than the norm.

Further, by combining the top of this range, i.e. 15 percent, with an estimated cereal gap of 23 percent, we are left with a deficiency in the HIV-infected adult in Nigeria of 38 percent kcal per day. For an adult male with HIV who has an estimated total requirement of 3358 kcal per day, this implies a shortfall of 1276 kcal per day, which would be found in about 380 gms of wheat flour, for example, or 350 gms of cornmeal.[7]

Amongst PLWHA there is a strong need for more information on nutritional needs and how they could make adjustments to their diet within their existing means. Amongst those, and amongst CBOs working in this area, there was also almost universal agreement that extension service personnel did not have the training to address this issue.

E2. Support Needs for Individual and Household

It is clear from the previous subsection that for the individual infected by HIV/AIDS the restoration of desirable nutrition levels is a priority need. How it may be addressed is discussed below, but it is only one of a number of areas of need that include psychological and practical counseling, nutritional education, anti-HIV drugs, and reassurance about the future of children.

The impact of having an HIV-infected adult in a household is different for different household members and over time. The three most affected categories are caregivers, widows, and children. During the period of illness and death a given individual may find themselves in more than one of these roles; thus a child may be a minor caregiver then a major caregiver, and a major caregiver is likely in due course to become a widow.

Caregivers need information and education about nutritional needs and alternative ways of meeting them, as well as hygiene and the psychological state of the infected person. Widows face great danger of social isolation upon the death of a husband who was suspected or known to have been suffering from HIV/AIDS, and the surviving children become highly vulnerable to economic deprivation. Support to hold families together needs to address the stigma against HIV/AIDS and income generation. Orphans require a variety of support that includes nutritional support and on-going food security, educational needs, and medical assistance.

[7] USAID *HIV/AIDS: A Guide for Nutrition, Care and Support*, July 2001:Table 6

F. Feasibility of Direct Food Distribution to PLWHA

Adequate availability of food is a recurring and pressing need, though the responses as to how this effectively might be met by direct distribution of food to PLWHA are varied. Principal problems include:

- *Disincentives.* The introduction of free supplies of food to areas can undermine local prices, threatening the livelihoods of farmers, merchants, and traders. Food aid could be monetized in the international market and the revenue used for direct distribution to PLWHA. Alternately, food could be purchased within the country.
- *Dependency*. Any food distribution scheme should be part of a larger program to facilitate income-generating activities for those living with or affected by HIV/AIDS.
- *Identification of recipients*. Due to the stigma attached to HIV few people are prepared be tested or to 'come out' as being HIV positive. Food could be directed to all households identified as food insecure, since the problem is poverty, to which HIV is one more dimension.
- *Channels of distribution.* Nigeria has had virtually no experience with large-scale programs of food distribution, causing problems of disconnected institutional arrangements.
- *Pride*. Many people may be too proud to accept charity, depending on how the donations are presented, their source, and their context.
- *PLWHA capabilities.* Associations of PLWHA would require considerable capacity building before they could be used as channels for the distribution of food.
- *Resentment from non-HIV/AIDS households.* In the absence of similar schemes to help other classes of poor households, the presence throughout the country of food distribution solely for PLWHA could cause resentment by other groups and increase stigma.
- *Fear of corruption and lack of accountability*. Food distribution networks that do not have their own storage and transport provision expose themselves to exploitation.

Many food assistance programs have been targeted at communities within well-defined geographic zones. In the case of HIV/AIDS, recipients are likely to be scattered throughout the country, necessitating complex and widely spread channels. Any such program will have to be adequately planned, groundwork prepared, and monitoring systems set in place. Finally, certain indirect effects should be considered. If food assistance to PLWHAs persuades significant numbers to come forward to be tested, pressures on clinic facilities would increase, which could lead to a substantial increase in numbers eligible for assistance, and the system should be able to respond at short notice. The question also arises as to how to deal with "affected" households, that is, with households that may have taken in a child from an "infected" household.

If a decision is taken to avoid stigma by distributing food to all poor households, then one possibility is through children at school. This not only provides an incentive to keep children at school, but is also self-policing as each parent will know what each child should be receiving.

Provision of Anti-Retrovirals

Provision of anti-retrovirals (ARVs) as an alternative to or supplement to food assistance would be an innovative and potentially cost-effective intervention. The total cost of food assistance costs less than the provision of ARVs. However, there is no long-term return to provision of food

assistance, as it does not significantly prolong the lifetime of PLWHA. The period of illness and final death generate immediate costs for households, long-term costs to communities, and ultimately the nation in terms of lost production, lost quality of care for children, and lost social capital. These costs endure over many years, far exceeding the cost difference between food assistance and ARV provision. Establishing infrastructure for ARV provision also has positive synergies for provision of other kinds of medical assistance. With ARVs there are also long-term, less quantifiable benefits including continued ability to invest in land, passing on knowledge and skills, holding households together, and minimizing institutional costs of orphans.

G. Summary and Potential Areas of Intervention

In Nigeria, malaria is widespread and is an important trigger in the development of AIDS and the associated opportunistic emergence of TB. Malaria is also more likely to be severe when it attacks people with HIV/AIDS and TB, thus forming a circle of infection and vulnerability that can significantly impact the livelihoods of those involved. Effects on appetite, digestion, and metabolism — the complications arising from HIV/AIDS — create a decline in the nutritional intake of PLWHA, reducing their ability to work and support their families. In recognition of these problems, at both the human and the national level, the Government of Nigeria has set in place since 1999 a number of institutional programs to tackle them.

Between and behind the interstices of this network lie the households, families, and communities directly affected by the diseases in question. The combined effect of HIV/AIDS, recurring malaria, and advancing TB on the food security of the average household in rural areas is to severely reduce the productive capabilities of that household. This is likely to elicit a variety of responses, ranging from an alteration in the crop mix to less labor-intensive plants, to increased borrowing or placing younger children in the homes of relatives. For non-agricultural households a parallel range of reactions will occur as the household reacts to the presence of chronic illness. In each case, whether rural or urban, agricultural or industrial, formal or informal, there will be a drop in income, which will have drastic consequences for the more than 60 percent of households already below the poverty line. Others will be pushed below the poverty line and into severe poverty. Often food is available in a community, or in an extended family, but it is not accessible.

Very rough calculations indicate that as many as 2 million households out of some 20 million in Nigeria may be affected by long-term sickness related to HIV/AIDS, and aggregate nutritional needs created by the disease amount to the equivalent of some 700,000 mt of wheat flour per annum. Although direct nutritional needs are of prime importance they need not take the form of food distribution. Many PLWHA and people affected by AIDS (PABA) need to know more about the nutritional component of different diets and of how they might change their diet to their benefit. Further, stigma caused by fear and ignorance about HIV/AIDS severely constrains the degree and quality of support provided by extended families and communities. Political commitment for an educational campaign would help in counteracting these attitudes. Finally, although the various official programs are well intentioned they are often poorly implemented and coordinated, both horizontally and vertically, and attention has to be given to improving the efficiency of governance, particularly at cross-ministerial levels. It is not our view that the direct

distribution of food is a viable or desirable strategy at this stage in the evolution of the HIV/AIDS epidemic in Nigeria.

Potential Areas of Intervention

- *Policy*. It is important that the Government of Nigeria retains the priority that it has given to this issue. We have shown that the prevalence of HIV/AIDS has a momentum of which the full impact has yet to be experienced, and that it may well still be accelerating.
- *Anti-stigma campaign.* The potential support for PLWHA from family and community is considerable but remains limited because of fear and stigma. Overcoming stigma would allow victims to harness the potential of the community for support of their household.
- *Subsidized provision of ARVs.* The ability of a program of ARV treatment in enabling a PLWHA to live a normal life could eliminate a portion of the alternative costs of dealing with the food insecurity that would otherwise afflict that person and his or her household.
- *Capacity building for CBOs.* Many CBOs are willing to take on responsibilities for supporting PLWHA but have limited structural and organizational capacity. Associations of PLWHA need attention in this area as advocates as well as deliverers of services.
- *Role of agriculture extension services.* The Ministry of Agriculture must address the production problems of households where senior adult members suffer from long-term sickness or premature death. Advice on alternative crops and techniques, assistance in coordinating labor, and marketing support would be part of such a package.
- *Nutrition and dietary advice.* A new high-profile program by the extension service of the MOA and the nutrition services of the MOH should be developed, not to exclusively target PLWHA but ensuring that they were included and their needs addressed.
- *Skills training for women and PLWHA*. A program to assist PLWHA and widows to embark on income-generating activities and specific occupational skills training is necessary to maintain a high level of independence for as long as possible.
- *Care for vulnerable women*. In many cases the extended family fails and women, both mothers and daughters, migrate to urban areas to seek income. Availability of hostel accommodation and income-generating opportunities are necessary.

SECTION V

Priority Options for Improving Food Security

Nigeria is food secure on a national basis. However, access to and utilization of food are major problems of food insecurity of especially rural households throughout the country. Many programs and projects of the Federal Government of Nigeria (FGN), the donors, NGOs, and others are addressing the complex issues that have given rise to the increasing rate of poverty and food insecurity in Nigeria. The issues are inter-linked and the many programs and projects include development approaches that impact the socioeconomic, demographic, agroecological, cultural, and other dimensions of the issues.

The linkages among agriculture/economics, nutrition, and HIV/AIDS necessitate development planning that, wherever possible, prioritizes and integrates the many and varied options given in each of the previous Sections for improving food security. The top priority options that address the greatest challenges for improving food access and utilization include:

1) Support an agribusiness development project, such as the Rural Sector Enhancement Programme (RUSEP), to assist enterprises and associations involved in expanding the processing and industrialization of the cassava and maize subsectors, the aquaculture industry, and the privatization and development of the country's abattoirs. Successful industrial development models in Nigeria (e.g., the poultry and flour-milling industries) can serve as prototypes for assisting the private sector in developing an integrated industry in cassava flour and modified starch production in the SE, maize-milling and industrial use processing in the Central zone, fish and shrimp culture in the SW and SE, and livestock abattoirs and cold chain for meat in the NW and NE. By integrating the marketing efforts of RUSEP to more processed or manufactured food industries may provide the demand pull that farmer and processor associations need to reach the scale of production necessary in Nigeria.

2) As part of the abovementioned agribusiness development project, support capacity building among smallholder farmer marketing associations and facilitate linkages with large processors and manufacturers utilizing cassava and maize products with the objective of developing contract farming in selected zones.

3) Support policy advocacy that assists the Government of Nigeria in addressing systemic problems preventing the agricultural sector from reaching the levels of investment, productivity, market access, and distribution that it is capable of. One area of policy advocacy that could have a direct impact on the market access and the distribution of agricultural produce would be advocating for an increase in the federal, state, and local government's rural infrastructure budget and developing a plan for coordinating the current budgeted and increased level of local government road improvements with that of the state and federal road improvement programs.[1] Though such a plan would require a

[1] Such a policy advocacy project worked in the southern Philippines in getting the Government of the Philippines, the state of Mindanao, and the local governments to earmark and follow through on necessary infrastructural improvements

timely needs assessment of infrastructure at the local and state levels and concerted coordination among officials at the local, state, and federal levels, and other representatives from the public and private sectors, the result of such systematic planning and an immediate implementation program would be not only improved market access but also a signal to the private sector that the government is serious about commercializing agriculture. It is recommended that this policy advocacy program, which could be implemented within five years if approved by the Government of Nigeria, be extended initially to only three states, one in the North belt, one in the Central belt, and one in the South belt. The specific states targeted for this policy advocacy and infrastructure development would be determined by the Government of Nigeria. Other donors, such as the World Bank and UNDP, would also need to be approached for additional coordination and funding assistance for this pilot project. Once aboard, and once the results of the coordinated and systematic approach are in, the expansion of this model by the government to other states would need the assistance of the World Bank, et.al.

4) Policy advocacy for full liberalization of the inorganic fertilizer market needs to continue. However, the caveat here is that the Government of Nigeria needs to address its macro policy problems, including depreciating exchange rates, high interest rates, and inflationary pressures, first in order for the private sector to be willing to invest in importing and/or producing fertilizer. Without an improved macro environment, a liberalized fertilizer market may not reach the level of competition that it would take to keep fertilizer prices affordable to the smallholder farmer. Along with the full liberalization of the inorganic fertilizer market, policies requiring proper labeling and quality assurance of fertilizer need to be advocated. USAID should continue to support the International Fertilizer Development Company (IFDC) in its policy advocacy efforts to get the fertilizer market liberalized and labeling and quality assurance programs instituted.

5) Increasing productivity of mixed farming by smallholder farmers while enhancing soil fertility, improving nutrition, and diversifying incomes. An improved farming system for smallholder farmers that needs to be extended beyond the localized area near Kano is the cowpea-based cereal/cowpea intercropping system developed by the International Institute of Tropical Agriculture (IITA) in Kano. The system involves planting 2 rows of improved sorghum or millet then 4 rows of improved cowpeas. The improved cowpeas are not only resistant to Striga, a parasite on cereals and legumes, but, furthermore, reduce the populations of Striga so that sorghum and millet are not infected. Early maturing varieties of sorghum, millet, and Striga-resistant cowpeas, also are used when rains are late in the North. The system requires only two bags of NPK, 1 bag of urea plus available organic manure. The inputs were provided to the farmer on a production credit basis with full payment expected after the harvest. The system yields about 1 mt/ha of cereal and 1 mt/ha of cowpeas as compared to the traditional farming system used in the area that yields (without fertilizer) an average of only about 350 kg/ha of cereals and 100 kg of cowpea. With two-thirds planted to cowpeas, the nitrogen fixation in the soil by the cowpeas enhances the fertility of the soil. The extra cowpeas produced are sold for cash and the cowpea fodder is used as a high-nutrient source to feed livestock during the lean

months in February through May. The extra cowpea production stimulates employment of women and children who do most of the cowpea harvesting and also provides a valuable protein source for enhancing the nutrition of the family. This farming system, then, provides multiple benefits to the rural household. It would be especially useful for a household where a head of household or parent has been afflicted with HIV/AIDS. The cowpeas' high-nutrient content, particularly protein, and meat from the added production of livestock would help the afflicted maintain a highly nutritional diet.

It is recommended that this farming system be extended more widespread throughout Kano, Kaduna, and Katsina states in the NW, and Bauchi and Jigawa state in the NE zone. In Kaduna and Bauchi states, the growing season is longer than up north, giving the farmer an opportunity to double crop cowpeas and also produce high-yielding and high-lysine maize varieties. USAID already has agricultural development projects (DAIMINA, RUSEP, ICS, Farmer-to-Farmer) being implemented in some of these states. The scope of these projects should be extended to include the above states. The extension of the farming system should be conducted with the assistance of the ADPs in each of these states, or through expanding the capacity of private sector service providers to perform extension related services. As more farmers adopt the improved farming system, technical assistance in storage, processing, and marketing activities would be provided by RUSEP and the Farmer-to-Farmer programs, facilitated by ICS, and coordinated with other FMARD and donor programs in the states. Since the supply of these crops would be expected to significantly increase, an MIS linking the various markets within and outside the states could be installed based on the experience of RUSEP and DAIMINA.

In addition to technical training in agricultural production and marketing, participating farmers and other members of their households could also be provided training in preparing and preserving food, food processing technologies, and adapting to the consequences of HIV/AIDS and other serious diseases that may afflict critical members or members of the household. To promote better nutrition at the local level, village level supplement and fortification programs using local processors of maize and sorghum should be assessed and implemented if shown to be feasible and effective. States in the NW and NE zones were selected because, on average, the rural population in these zones has the highest food insecurity in the country, the greatest problems of stunting and wasting, high dependency ratios, low literacy rates among women and heads of household, and also a relatively high incidence of HIV/AIDS and other serious diseases that impact their household food security.

6) Support the establishment of marketing centers for targeted crops/livestock such as maize and rice in Niger in the Central zone, cowpeas and groundnuts in Kano and Bauchi in the NW and NE, plantains in Abia in the SE, sheep and goats in Katsina in the NW and Adamawa in the NE, and fish in Rivers in the SE and Oyo in the SW zones. The marketing center would be an extension of USAID's ongoing ICS project, already operating in many of these states. These marketing centers would serve as a clearinghouse for market information for buyers and sellers of these commodities. It would assist producer associations in accessing credit and establishing production

contracts with downstream processors. It is expected that these marketing centers would become self-sustaining through provision of a diverse set of marketing services.

7) Support development of roots/tuber/maize/legume farming system research at both IITA and national institutes and the extension by RUSEP, or RUSEP-like project, with assistance from the ADPs, in the SE and SW zones. Support RUSEP in assisting the smallholder farmers in the SW (Oyo and Oshun states) and the SE (Abia and Enugu states) in diversifying their mixed farming system to include more legumes, livestock, and plantains/bananas. Such diversification would lead to higher expected and stability of farm income, improved soil fertility, greater availability of organic manures, increased access to high-protein foods, and improved food security. The crop production technologies for intercropping legumes and roots and tubers may need additional research efforts in integrated pest management and crop allocation since the soil and environment in the humid tropics (especially in the SE zone) may react differently than that in the north, for instance. Use this and other research support to help strengthen the weak link that currently exists between national and international research institutes in Nigeria.

8) In addition, as crop diversification intensifies in the south, and more nutritious and volume of fodder are available, more emphasis in improving the yield and the feed formulations for pigs, poultry, and fish needs to be made. The two states in each of the southern agroecological zones were selected because RUSEP, ICS, and IITA's plantain/banana projects operate in Oyo and Abia States. Enugu state was also selected because it has a high rate of HIV/AIDS infection among adults. The state must come to grips with the implications that this affliction has on available household labor and its productive population. Special attention must be paid in the design of the type of technology packages and the labor requirements of the appropriate diversification extended to households afflicted with HIV/AIDS. In addition, special focus must be made to train women and women's groups in these states in nutrition, food storage, food preservation, and food safety, and promote a village level supplement and fortification program in cassava and maize.

9) Accessing microcredit for smallholder farmers and agro-processors, especially women, has been and continues to be a problem. However, there are examples of commercial banks, including Union Bank, and community banks extending production loans to smallholder farmers and the loans being paid back. Innovative ways for smallholder farmers and agroprocessors to access this microcredit available from these banks should be determined and integrated into the RUSEP, DAIMINA, and other USAID agricultural development projects.

10) Support advocacy programs that call for more humane implementation of existing law or traditional custom on inheritance rights for women (especially those widowed from HIV/AIDS-related deaths).

11) Assess the cost/benefit of supporting a program that distributes anti-retrovirals on a subsidized basis to those afflicted by HIV/AIDS.

12) Help strengthen government capacity for data collection and analysis in nutrition, agriculture (for monitoring crop production and profitability), and HIV/AIDS and help extend the national surveillance systems in nutrition countrywide. Support the government in developing and implementing an Early Warning System approach to determining the most vulnerable households nationwide (including vulnerability in relation to seroprevalence).

13) Support the relocation of the NFCN under the Presidency. Relocating the NCFN under the Presidency is necessary to get nutrition and its critical issues on the national agenda.